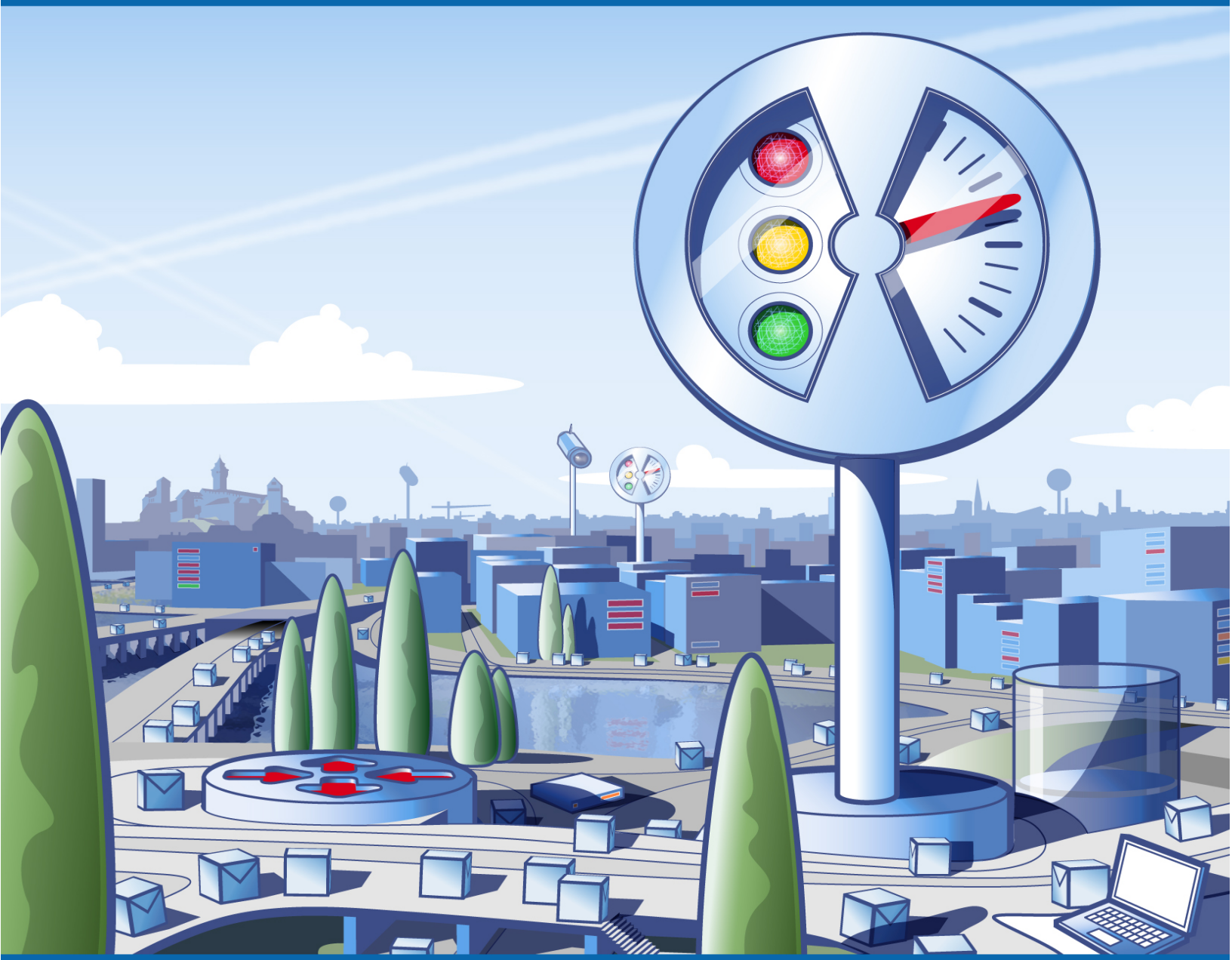
PRTG Network Monitor V 7
User Manual

- Bandwidth monitoring
- Availability monitoring
- Usage monitoring



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Part I

System Requirements

1 System Requirements

In order to install and work with PRTG Network Monitor you need:

- A PC, server or virtual machine with roughly the performance of an average PC built in the year 2007 or later
- Operating system Microsoft Windows XP, 2003, Vista or 2008 (32-bit or 64-bit)
- Web browser Google Chrome, Firefox 3 or Internet Explorer 7/8 (to access the web interface)

For more detailed information and if you plan a larger installation see Detailed System Requirements.

Planing an installation with hundreds of sensors or more?

As a rule of thumb an average PC/server built in the year 2007 or later should be able to monitor 1,000 sensors with ease (some exceptions for SNMP V3, WMI and packet sniffing apply). For larger installations please refer to our knowledge base article "Planning Large Installations of PRTG Network Monitor 7": http://www.paessler.com/support/kb/prtg7/system_requirements

1.1 Detailed System Requirements

Operating Systems for PRTG Core Server and PRTG Probe

The 32-bit and 64-bit versions of the following operating systems are officially supported for PRTG "Core Service" and "Probe Service":

- Microsoft Windows XP
- Microsoft Windows Vista
- Microsoft Windows Server 2003
- Microsoft Windows Server 2008

Hardware Requirements for PRTG Core Server and PRTG Probe

Hardware requirements mainly depend on the sensor types and intervals used. The following values are provided as reference for common usage scenarios of PRTG 7 (based on a default sensor interval of 60 seconds).

- CPU: An average PC built in 2008 can easily monitor 1,000 sensors (see sensor type specific notes below).
- RAM: You will need about 150KB of RAM per sensor.
- Hard Disk: You will need about 200KB of disk space per sensor per day (for sensors with 60 second interval).
- An Internet connection is required for license activation (via HTTP or email).

There are also non-hardware dependent limitations for some sensor types, e.g. WMI and SNMP V3 sensors. These limitations can be overcome by distributing the sensors across multiple remote probes. If you plan installations with more than 500-1,000 sensors or more than 10 packet sniffing/NetFlow sensors please consult the PRTG Site Planner tool ("Help" menu).

Here is a sample for a very large installation: We have successfully tested PRTG Network Monitor running with 30,000 SNMP sensors on a Dual-CPU Quad-Core system (Dell 2900 III) with 16GB RAM on Windows 2003 64-bit. This scenario required about 3GB of RAM for the PRTG processes, the CPUs were running at 20% load and it created about 1.5TB of data on the disk for one year. An installation of this size is able to monitor 625 SNMP-enabled switches with 48 ports each.

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Running PRTG on Virtual Machines

PRTG Core Server as well as PRTG Probe can be run on virtualized platforms. The following virtualization platforms were tested successfully:

Technology	Client OS
VMware ESX Server 3.5	Windows XP, Windows 2003 (32/64 bit), Windows Vista, Windows 2008
VMware Server 2.0	Windows XP, Windows 2003 (32/64 bit), Windows 2008
XEN Server 5.0	Windows XP
Parallels Virtuozzo Containers	Windows 2003 Server (32/64 bit)
Amazon EC2	Windows Server 2003

Web Browser Requirements

The following browsers are officially supported for the PRTG web interface (in order of performance and reliability):

- Google Chrome 1.0 (recommended)
- Mozilla Firefox 3.0
- Microsoft Internet Explorer 8
- Microsoft Internet Explorer 7

Requirements for Monitored Devices

- SNMP monitoring: The monitored device(s) must be equipped with SNMP Version 1, 2c or 3 (i.e. a SNMP-compatible software must be installed on the device). SNMP must be enabled on the device and the machine running PRTG must be allowed access to the SNMP interface.
- WMI monitoring: In order to use WMI (Windows Management Instrumentation) monitoring you will need a Windows network. For client PCs monitored with WMI only Windows XP and later are officially supported (XP, 2003, Vista, 2008, etc.). Windows 2000 is not officially supported
- NetFlow monitoring: The device must be configured to send NetFlow data packets (NetFlow Version 5) to the machine running a PRTG Probe.
- Packet Sniffing: Only data packets passing the local machine's network card can be analyzed. Switches with so-called "monitoring ports" are necessary for network-wide monitoring in switched networks.

Requirements for the Tray Tool and the iPhone Interface

The optional PRTG Tray Tool runs under all Windows versions (Windows 95 or later). The optional iPhone interface was created for Apple iPhone firmware 2.0.

Planing an installation with hundreds of sensors or more?

As a rule of thumb an average PC/server built in the year 2007 or later should be able to monitor 1,000 sensors with ease (some exceptions for SNMP V3, WMI and packet sniffing apply). For larger installations please refer to our knowledge base article "Planning Large Installations of PRTG Network Monitor 7": http://www.paessler.com/support/kb/prtg7/system_requirements

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Part II

Installation

2 Installation

To use PRTG Network Monitor you need to download and install the software as described in the following sections:

- Downloading the Software: How to get the latest version from Paessler
- Upgrading to Version 7 from Previous Versions: Read this if you have used PRTG Traffic Grapher 6 or IPCheck Server Monitor 5 before
- Installation of the PRTG Core Server: How to install the PRTG core server software on your PC/Server
- Entering A License Key: How to enter a license key
- Uninstallation: How to remove the software from your PC/Server

2.1 Downloading the Software

Please download the latest version of PRTG Network Monitor from the Paessler website. There are two different installers for PRTG, a public download for the Freeware and Trial editions, and another download for the commercial editions (which is only available for paying customers).

Downloading the Freeware Edition and Trial Edition

Please download the latest publicly available file from the Paessler website at www.paessler.com/prtg/download

Downloading the Commercial Editions

Upgrades are free to customers with an active maintenance contract. Please log into the Paessler website at www.paessler.com/login to get the latest download.

If you do not have an active maintenance contract, please contact sales@paessler.com

2.2 Upgrading to Version 7 from Previous Versions

Upgrading from Older Version 7.x Versions

If you have been running PRTG Network monitor with an earlier V7.x version number, simply install the latest version on top of the previous version.

Upgrading from PRTG Traffic Grapher 6 or IPCheck Server Monitor 5

If you have been running one of the two predecessor products of PRTG 7 (namely PRTG Traffic Grapher Version 6 or IPCheck Server Monitor Version 5), you can import most of your data (monitoring setup and historic data) into PRTG 7. Importing data from earlier versions is not possible.

Please refer to this knowledge base article on the Paessler website:

http://www.paessler.com/support/kb/prtg7/tricks/data_import_from_prtg6_or_ipcheck5/

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2.3 Installation of a PRTG Core Server

Installing the software is similar to other Windows-based applications. To install the application please insert your PRTG CD-ROM into your computer or open the installation setup routine from the ZIP file you have downloaded.

The usual software installation wizard will guide your through the installation process:

Setup - PRTG Network Monitor
Welcome to the PRTG Network Monitor Setup Wizard
This will install PRTG Network Monitor (Commercial-Edition) on your computer.
It is recommended that you close all other applications before continuing.
Click Next to continue, or Cancel to exit Setup.
PAESSLER
Next >
Cancel

Please click "Next" to walk through the wizard. After accepting the license agreement, you can choose the folder you wish to install the software in. As soon as you click "Next", the necessary files will be copied to your disk and a dialog asking for your license type will appear.

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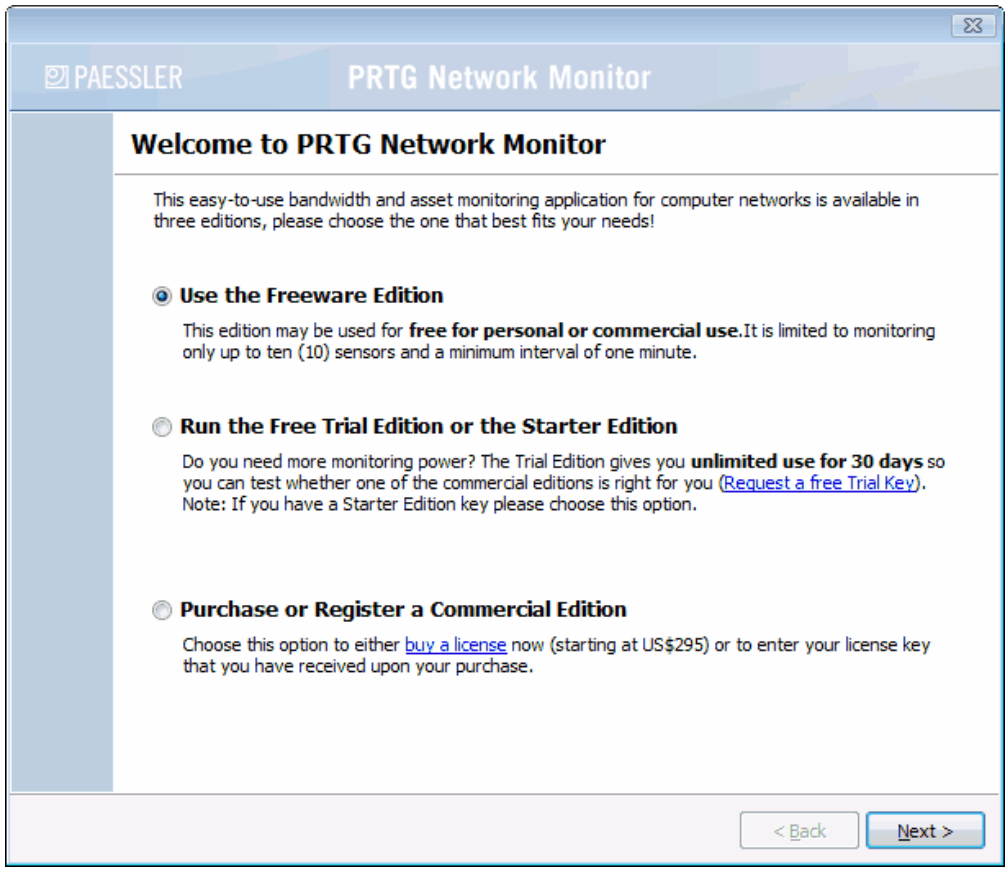
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PRTG Network Monitor
Welcome to PRTG Network Monitor
This easy-to-use bandwidth and asset monitoring application for computer networks is available in three editions, please choose the one that best fits your needs!
Use the Freeware Edition
This edition may be used for free for personal or commercial use.It is limited to monitoring only up to ten (10) sensors and a minimum interval of one minute.
Run the Free Trial Edition or the Starter Edition
Do you need more monitoring power? The Trial Edition gives you unlimited use for 30 days so you can test whether one of the commercial editions is right for you (Request a free Trial Key). Note: If you have a Starter Edition key please choose this option.
Purchase or Register a Commercial Edition
Choose this option to either buy a license now (starting at US$295) or to enter your license key that you have received upon your purchase.
< Back
Next >

Please select the proper option and enter the necessary data.

Afterwards you will see a dialog with some base settings:

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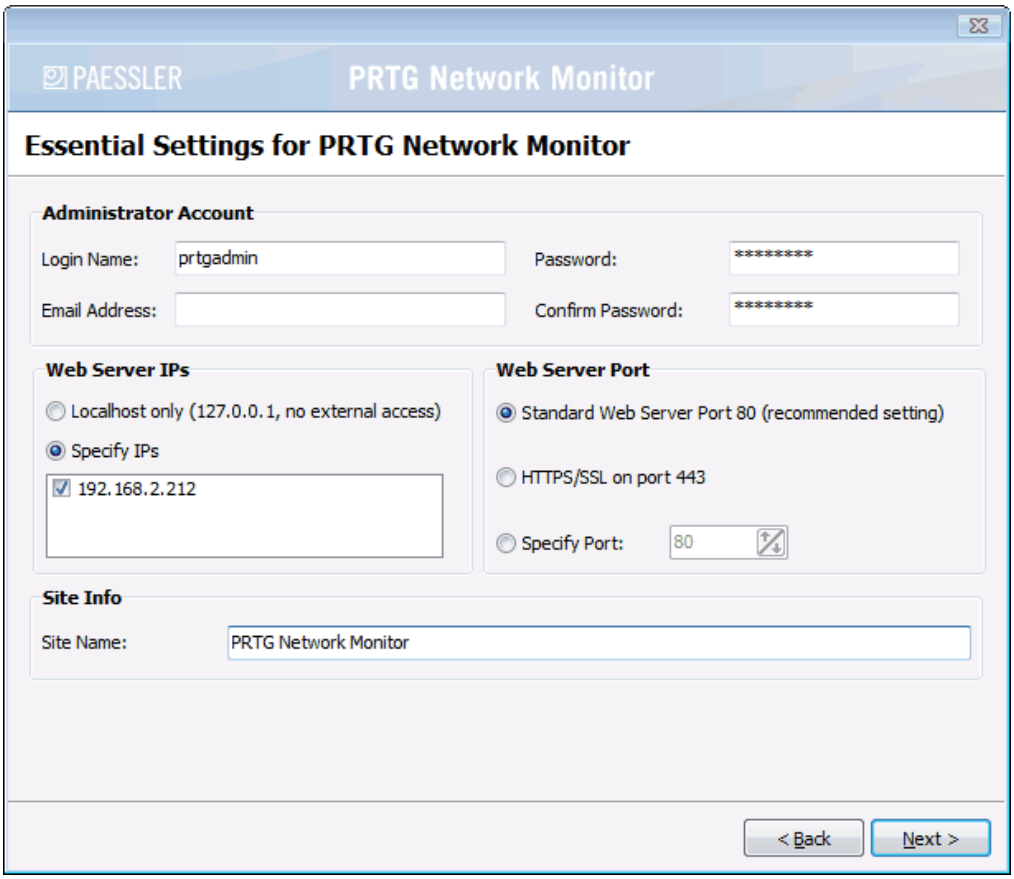

Usually the only edit field that you need to look at is the "Email Address" field. Please enter your email address here.

You may also want to review and edit the following settings:

- Optionally you can provide a "Login Name" and "Password" of your choice (the default is username "prtgadmin" and password "prtgadmin"). Selecting a private password is especially important if you plan to make your PRTG website available on the Internet.
- Please review the "Web Server IPs" and "Web Server Ports" settings. In most cases the default values should be fine.
- Optionally you can enter a custom "Site Name" for your PRTG website (e.g. "My Company Monitoring").

Please click "Next" one more time to finish the installation. When the installation is complete, the computer may ask you to restart the machine to properly complete the installation. Although you can choose to reboot later, it is strongly recommended to reboot the machine right away to fully complete the installation.

That's it. You can now work with PRTG Network Monitor!

2.4 Entering A License Key

A license key for PRTG Network Monitor consists of the name of the licensee and a string that contains 70 characters and numbers. This information is usually sent to customers via email:

- Sample Username: Paessler AG

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- Sample License key: 0223515-FFSEJC-ZHGRDFM-URDCS8-U7TFGK-G665F2-YVFCDD-H8823N-D99HG9-MFDRG

You can either enter the license key during the installation process or you can use the PRTG Server Administrator tool to enter a license key.

Step 1: Make Sure You Have Installed The Correct Edition

There are two different installers available for PRTG (see Downloading the Software):

- The publicly available installer only contains the Freeware, Starter and Trial Editions
- The Commercial installer is only available for download for paying customers

The Commercial Installer must be installed to run the commercial editions of PRTG Network Monitor. **If you have purchased a license key for PRTG you must download and install the latest Commercial Installer from the Paessler website in order to apply your license key.**

Step 2: Enter the License Key in the Server Admin Tool

You must enter the license key into the server administrator program. To start the PRTG Server Administrator select or double click the respective icon:

Select the License tab and enter your license key. To avoid typos please copy and paste the name and the key from the license key email that you have received from Paessler AG:

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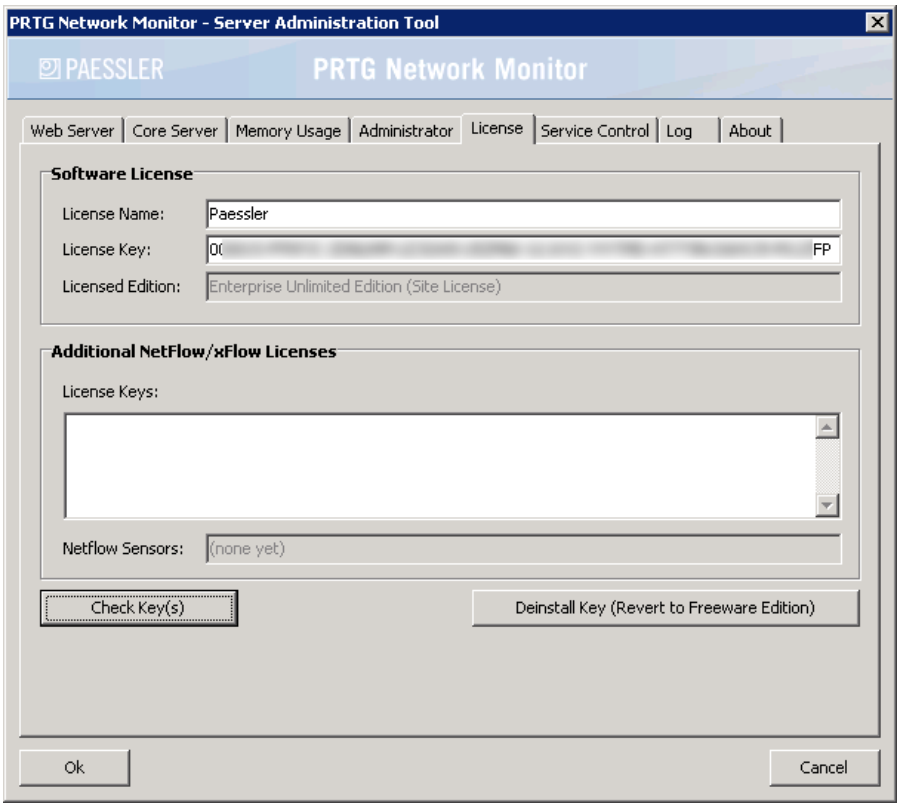

To make sure your key has been entered correctly please click on "Check Key(s)". In the field "Licensed Edition" you will able to see the accepted licence key

Entering a Netflow/xFlow License Key

NetFlow keys only consist of the code (70 characters and numbers) and are not specific to your company name. If you have purchased a NetFlow license key you must also start the Server Administrator tool to enter the key. Select the License tab and paste the key(s) into the "Additional NetFlow Licenses" box. To make sure your key has been entered correctly please click on "Check Key(s)".

2.5 Installation of a PRTG Remote Probe

PRTG has two modules that perform the monitoring: The core server, which handles data storage, web server and a lot more, plus one or more "probes" which perform the actual monitoring. Please see Multiple Probes and Remote Probes for details.

2.6 Uninstallation

To uninstall PRTG Network Monitor:

- Select the Add/Remove Programs option from the computer's Control Panel.
- Select PRTG Network Monitor from the list of programs.
- Click the Remove button to uninstall the program.

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Or select the "Uninstall PRTG Network Monitor" icon from the PRTG Network Monitor group in the Start|Programs menu.

Note: During uninstallation, your monitoring data will not be removed automatically.

After the completion of the uninstallation process of the software please check the PRTG Network Monitor installation folder and delete all remaining files that you do not want to keep. Also, please check the "\Documents and Settings\All Users\Application Data\Paesser\PRTG Network Monitor\V7" (Windows XP) folder for remaining data files which are not automatically removed.

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Part III

Introduction

3 Introduction

Today, most businesses rely on a computer and network infrastructure for Internet, internal management, telephone and email.

A complex set of servers and network equipment is required to ensure that business data flows seamlessly between employees, offices and customers. The economical success of an organization is tightly connected with the flow of data.

Why Network Monitoring is Important

So, the computer network's reliability, speed and efficiency are crucial for businesses to be successful. But, like all other technical objects, network devices may fail from time to time - potentially causing trouble and loss of sales - no matter what mitigation efforts have been made up-front.

Network administrators, need to take three key steps to maintain network uptime, reliability, and speed:

1. Set up a well-planned network with reliable components.
2. Create recovery plans for the event of device failure.
3. Monitor their network to know about failures as they build up or actually happen.

PRTG Network Monitor, the software described in this document, is a complete solution for monitoring small, medium and large networks.

Monitoring Networks with PRTG Network Monitor

PRTG Network Monitor is a powerful network monitoring application for Windows-based systems. It is suitable for small, medium and large networks and capable of LAN, WAN, WLAN and VPN monitoring.

It monitors network availability and bandwidth usage as well as various other network parameters such as memory and CPU usages. It provides system administrators with live readings and periodical usage trends to optimize the efficiency, layout and setup of leased lines, routers, firewalls, servers and other network components.

The software is easy to set up and use and monitors a network using SNMP, WMI, packet sniffing, Cisco NetFlow as well as many other industry standard protocols. It runs on a Windows-based machine in your network for 24-hours every day. PRTG Network Monitor constantly records the network usage parameters and the availability of network systems. The recorded data is stored in an internal database for later reference.

3.1 Key Features

PRTG Network Monitor can be used to:

- monitor and alert for uptimes/downtimes or slow servers.
- monitor and account bandwidth and network device usage.
- monitor system usage (CPU loads, free memory, free disk space, etc.).
- classify network traffic by source/destination and content.
- discover unusual, suspicious or malicious activity with devices or users.
- control SLA agreements.
- discover and assess network devices.

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The PRTG installer contains all modules and software necessary to run the monitoring system without the need for third party modules, inlcuding:

- Paessler's own fast and efficient database system to store the raw monitoring results.
- built-in web server with HTTP and HTTPS support for the user interface.
- mail server for automatic email delivery.
- SQLite SQL Server for storage of monitoring events.
- report generator to create PDF reports.
- graphics engine for user-friendly charts.
- network analysis module to auto-discover devices and sensors.

PRTG Network Monitor can support thousands of sensors and can optionally work with multiple remote probes (agents) to monitor multiple sites or network segments from one central core installation. The software is based on Paessler's proven monitoring technology, which has been constantly improved since 1997 and is already used by more than 150,000 users around the world every day.

Attractive licensing packages from freeware (up to 10 sensors) to enterprise level, with thousands of sensors make sure that every user finds the proper solution.

3.2 Available Licenses

There are three editions available:

Freeware Edition and Starter Edition

The Freeware Edition is a good solution to get started with PRTG or for private use:

- May be used for free for personal and commercial use.
- Can monitor up to 10 sensors (Starter Edition: 20).
- Supports all available sensor types (except NetFlow).
- Shortest available monitoring interval is one minute.

This edition runs as default after installation when no license key is entered.

Trial Edition

The Trial Edition is intended for evaluation purposes for customers who are interested in purchasing commercial licenses:

- Can monitor up to 500 sensors.
- Supports all available sensor types (including NetFlow).
- Shortest available monitoring interval is one second.
- Temporary license key must be requested from Paessler's website.
- Trial period limited to 30-days (automatically reverts to Freeware Edition afterwards).

Free trial license keys are available on our website at http://www.paessler.com/prtg/trial

Commercial Editions

There are several different licenses of PRTG Network Monitor available to suit the demands of smaller, as well as larger customers and organizations.

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- Maximum number of sensors depends on the license (100 or more).
- Supports all available sensor types (including NetFlow).
- Shortest available monitoring interval is one second.

To learn more about pricing and feature matrix or to order licenses please visit: http://www.paessler.com/order

3.3 About This Document

This document introduces the reader to the system concepts of PRTG Network Monitor and explains how to set up the software to achieve the best results. You will learn how to plan your monitoring setup, how to set up your sensors, reports, maps and user accounts.

This document does not explain each and every edit field or button of the user interface. Detailed information is included in PRTG's web interface itself in the form of short contextual help texts and hints. Also, this document is not a technical in-depth documentation of file formats, APIs and other background information. This information is available online on the Paessler knowledge base at www.paessler.com

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Part IV

Basic Concepts of PRTG Network Monitor

4 Basic Concepts of PRTG Network Monitor

There are a number of basic concepts that lay the foundation for the functionality and ease of use of the PRTG Network Monitor. Please read this section carefully to make it easier for you to understand how best to use the software.

- Architecture: PRTG Core Server and PRTG Probe
- Object Hierarchy: Probes, Groups, Devices, Sensors, Channels
- Inheritance of Settings
- Notifications, Schedules, and Dependencies
- Reports, Maps, and ToDos
- Priorities and Favorite Sensors
- Default Values

4.1 Architecture: PRTG Core Server and PRTG Probe

PRTG Network Monitor consists of two main parts:

- **PRTG Core Server**: The central part of a PRTG installation is the "Core Server" that includes the data storage, web server, report engine and notification system.
- **PRTG Probe**: A "probe" performs the actual monitoring. It receives its configuration from the Core Server, runs the monitoring processes and delivers monitoring results back to the Core Server. A Core Server always has a Local Probe running on the same server. Additionally a Core Server can manage an unlimited number of Remote probes in order to achieve multiple location monitoring.

Both are Windows services which are permanently run by the Windows system without the requirement for a logged-in user.

Additionally, there are the two administrator tools, "PRTG Server Administrator" and "PRTG Probe Administrator", to configure basic settings such as the admin login and webserver IPs.

Core Server

The Core Server is the heart of your PRTG system and contains the following processes:

- Configuration management for object monitoring.
- Management and configuration of the connected probes.
- Storage of raw monitoring results.
- Notification management including a mail server for email delivery.
- Report generator and scheduler.
- User account management.
- Data purging (culling data that is older than 365 days, for example).

The Core Server also includes a built-in, fast and secure web server (no IIS or Apache is required) that supports HTTP as well as secure HTTPS (via SSL). The Ajax-based interface is used for the configuration of devices and sensors, as well as the review of monitoring results. The web interface is highly interactive and uses Ajax to deliver a powerful and easy-to-use user experience. While the user is logged in, the data on the screen is permanently refreshed (via Ajax calls) so it always shows the current monitoring results (refresh interval and method can be set by the user). The global monitoring statistics are always shown at the top of the page, including number of sensors with an error, warning, down, paused or unusual status plus a graph showing a recent history of alarms, bandwidth usage, CPU usage and speed indices for all sensors.

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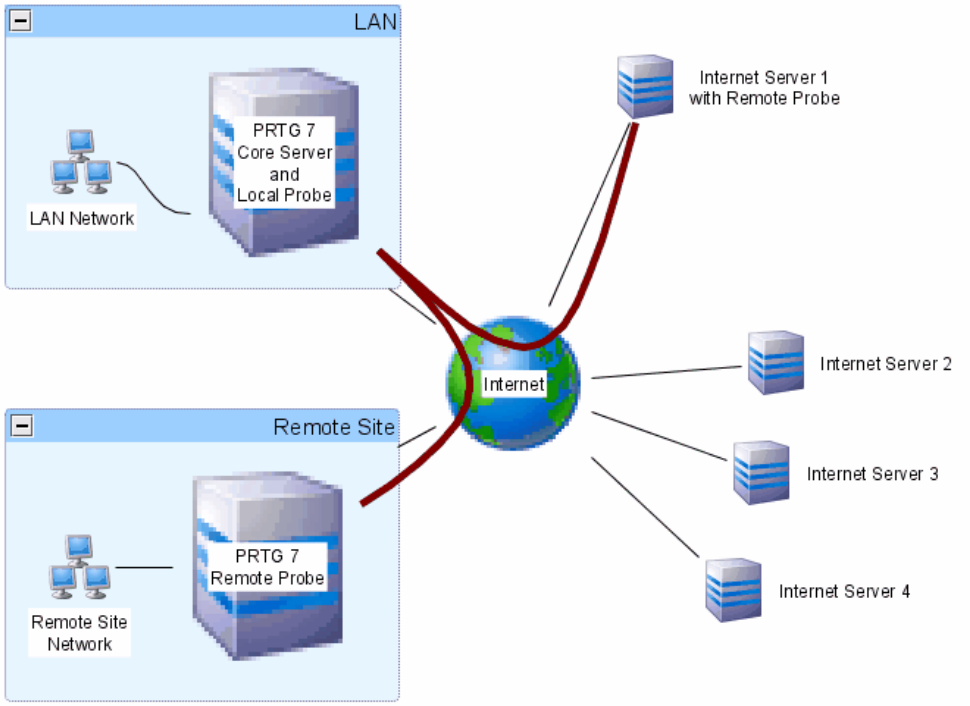
Probes

The actual monitoring is performed by PRTG Probe processes which run on one or more computers. During installation the so-called "Local Probe" is automatically created by the system. In a single-probe installation - which is the default setup - all monitoring is performed by the local probe.

Additional remote probes must be created by the user. They are using SSL secured connections to the core and allow to securely monitor services and systems inside remote networks which are not openly accessible or secured by firewalls. The following chart shows an example: The PRTG Core Server inside the LAN (top left) is able

- to monitor secured services inside the "LAN" using the local probe
- to monitor secured services inside the "Remote Site" (bottom left) using a Remote Probe installed on a dedicated probe server
- to monitor secured services on "Internet Server 1" using a Remote Probe installed directly on this server
- to monitor public services on "Internet Servers 1, 2, and 3" via the Internet using any of the probes.



See Multiple Probes and Remote Probes for more information on remote probes.

After receiving their configuration from the Core system, all probes are able to work independently of the Core server for some time, e.g. in case the connection between probe and Core is lost due to connectivity problems. During a connection loss a buffer stores a maximum of 500.000 sensor results in RAM memory of the remote probe system (up to about 50-200 MB). This means that for 100 sensors with 1 minute interval the monitoring results of up to 3 days can be buffered (or 52 minutes for 10.000 sensors with 1 minute interval). The probe automatically reconnects to the Core as soon as it is available again and transmits all monitoring results gathered during the connection loss.

PRTG automatically monitors the "system health" of the Core server and each probe in order to discover

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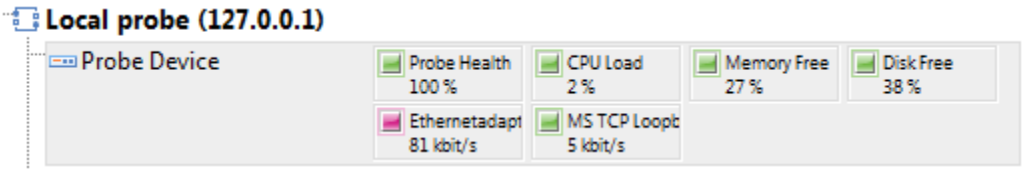
overloading situations that may distort monitoring results. To do this, the system automatically creates a number of sensors for each probe to monitor the their system status:



It is recommended to keep these sensors, but you can optionally remove all except for the "Probe Health" sensor. It measures various internal system parameters of the probe system hardware and the probe's internal processes and then computes a resulting value. Frequent or repeated values below 100% should be investigated, please check the sensor's channels for details.

4.2 Object Hierarchy: Probes, Groups, Devices, Sensors, Channels

In PRTG Network Monitor, the actual monitoring is performed by "sensors". Each of these sensors monitors one single aspect of a network device. For example:

- one network service like SMTP, FTP, HTTP, etc.
- the traffic of one port or a network switch.
- the CPU or memory load of a device.
- one network card's traffic.
- one NetFlow device, etc.

Sensors are arranged in a tree-like hierarchy to create an easy to navigate list and to give the user the possibility to arrange them in groups that monitor similar devices, locations or services.

Users can create nested "groups"; each group has a number of "devices"; each device has a number of "sensors" and - finally - each sensor has one or more "channels" (e.g. IN and OUT channel, or one channel for each CPU for a multiprocessor system, etc.).

You will also see a level for "Probes" in the hierarchy. All groups/devices/sensors that are configured below a probe will be monitored via that probe (see Multiple Probes and Remote Probes).

Here is a sample configuration:

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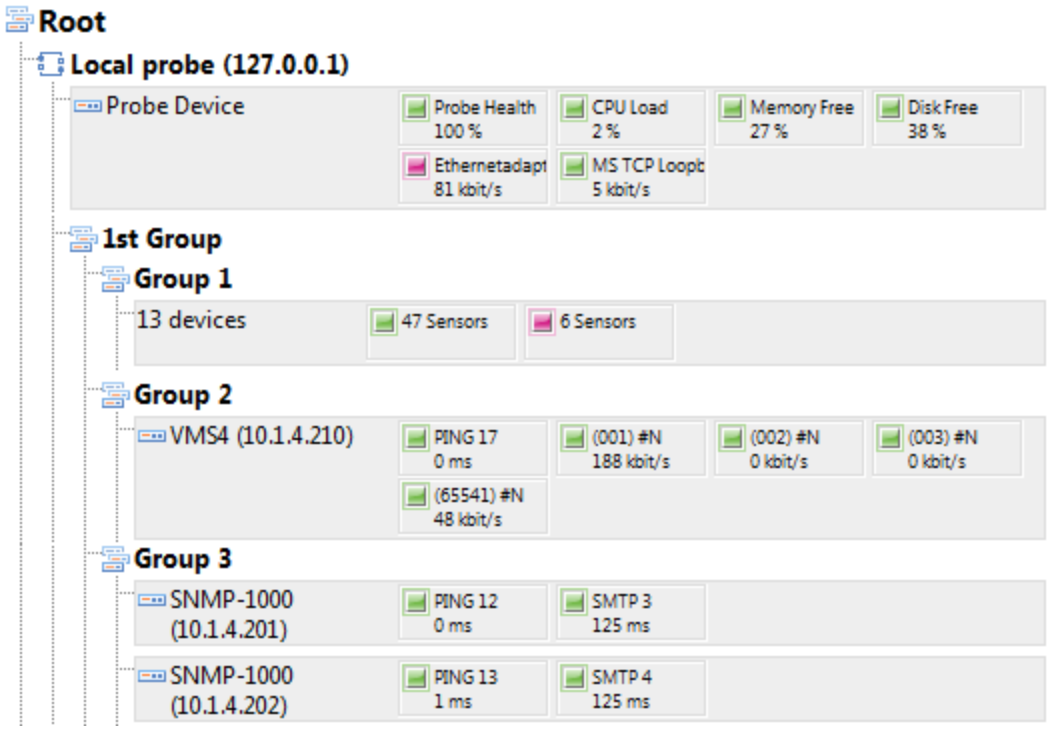

4.3 Inheritance of Settings

The hierarchical list is not only used to group sensors to organize them, there is also an important aspect involved that we call "Inheritance". To ensure administration is quick and easy – especially for large monitoring setups - certain settings are "inherited" from the overlying level. For example, you can change the monitoring interval for all sensors by editing the interval setting of the topmost "root" group.

You can override this inheritance on any level of the hierarchy by setting a different value for a specific group/device/sensor. Then - again - all objects below the object that has overridden settings will inherit these settings, not the ones from the levels above.

Settings that are inherited among all objects include:

- Monitoring interval.
- Notifications and Triggers.
- Windows authentication settings (e.g. for WMI sensors).
- ESX Server authentication settings (for VMware servers)
- SNMP authentication settings and compatibility settings.
- Channel and unit configuration.
- User access rights.
- Paused status: if an object is paused by the user, by a schedule or by a dependency, all associated sensors are paused as well.

There is one exception for devices and sensors: The IP address (or DNS name) of a device and the SNMP and WMI settings are always inherited by sensors and can not be changed on sensor level.

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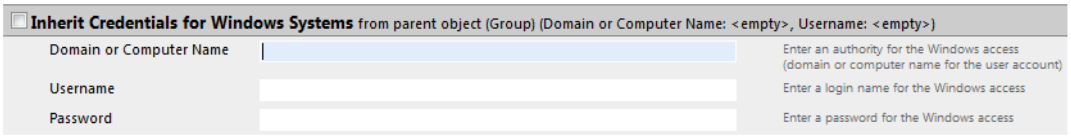
The actual overriding of the parent's settings takes place by selecting the radio button "specify settings for this (object)" on the object's settings page. This screenshot shows Windows authentication settings:


Inherit Credentials for Windows Systems from parent object (Group) (Domain or Computer Name: <empty>, Username: <empty>)
Domain or Computer Name
Enter an authority for the Windows access (domain or computer name for the user account)
Username
Enter a login name for the Windows access
Password
Enter a password for the Windows access

4.4 Notifications, Schedules, and Dependencies

PRTG offers the following three concepts that can help to set up a monitoring configuration.

Notifications

Whenever PRTG discovers downtime, an overloaded system, threshold breach or similar situations, it will send a "notification". Notifications use various methods by which you can be notified (e.g. email, SMS, pager message, among others). After creating notifications in the system settings, you can select them on the group, device and sensor settings pages. See Notifications for more details.

Schedules

Group, device or sensor monitoring can be paused by user intervention or by a "schedule" (e.g. don't monitor Sundays between 4 and 8am). Using schedules, you can limit the monitoring time. PRTG comes with a number of pre-defined schedules that you can edit - or you can add your own schedules.

Dependencies

Using "dependencies", you can pause sensor monitoring based on the status of another sensor in order to avoid false alarms and incorrect downtime recording. A dependency stops the monitoring of one sensor or a set of sensors as soon as another specified sensor is down. This means, for example, you can stop monitoring remote network services when the corresponding firewall is down due to connection problems.

There are three options for dependencies:

- "Use Parent": By default, all objects depend on their parent object. This means that if you specify a dependency for a group and the dependency sensor goes down or is paused, all sensors in the group will be paused.
- "Select Object": To set up a dependency, go to the settings page of an object that is intended to "depend" on another object. Then select the object it shall depend on from the list:

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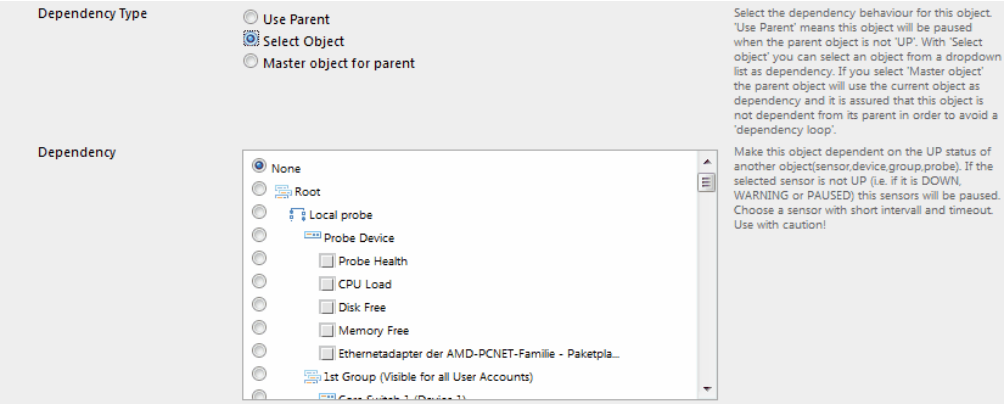
Dependency Type
Use Parent
Select Object
Master object for parent
Select the dependency behaviour for this object. 'Use Parent' means this object will be paused when the parent object is not 'UP'. With 'Select object' you can select an object from a dropdown list as dependency. If you select 'Master object' the parent object will use the current object as dependency and it is assured that this object is not dependent from its parent in order to avoid a 'dependency loop'.
Dependency
Make this object dependent on the UP status of another object(sensor,device,group,probe). If the selected sensor is not UP (i.e. if it is DOWN, WARNING or PAUSED) this sensors will be paused. Choose a sensor with short intervall and timeout. Use with caution!
None
Root
Local probe
Probe Device
Probe Health
CPU Load
Disk Free
Memory Free
Ethernetadapter der AMD-PCNET-Familie - Paketpla...
1st Group (Visible for all User Accounts)

As soon as the object you have chosen from the list enters a "red" state (goes down) or is paused, the monitoring for the dependent object (and all its child objects) will be paused and no notifications will be sent.

- "Master Object": This setting will make the sensor the so-called "Master Object" for its parent device. All sensors of the parent device will be paused whenever this Master Sensor is down. It is recommended to set a basic sensor (e.g. PING) to be the master sensor (for example, the auto-discovery sets the PING sensors for each device as the Master Objects).

4.5 Reports, Maps, and Todos

Reports

"Reports" are used to analyze monitoring data, either once or at specified intervals. You can define any number of reports, specify the sensors for a report, select a template and run them at any interval you like, such as once, daily, weekly or monthly.

Read more about reports.

Maps

Using "Maps" you can create personalized overviews and dashboards of your monitored network. A map can include a background image, such as a network drawing, and you can place status icons, lists of sensors as well as graphs with your current monitoring status on the map.

You can define any number of maps and use them to create a NOC Dashboard, an overview of the network status for your Intranet, a webpage with the graphs of your most important sensors and more. By using the Public Map feature, you can provide others with URLs to a map so they can view the data without the need for a user account.

Read more about maps.

ToDos

Whenever PRTG comes across an event or monitoring object that needs the administrator's attention, it will add an entry to the "ToDo list" and send an email to the admin user.

ToDos are created when:

- a new device or sensor has been created by the auto discovery process and should be acknowledged by the

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user.
- a new probe connects to the Core and must be acknowledged.
- a new version of the software is available.
- a new report is ready for review.
- and a few other situations, such as when the system runs out of disk space, licensing issues, etc.

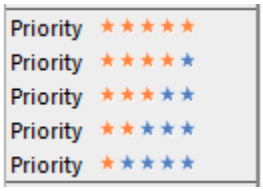
Read more about ToDos.

4.6 Priorities and Favorite Sensors

Priority

You can specify a priority for each object in the sensor tree, shown with 1 star ("*") for the lowest priority to 5 stars ("*****") for the highest priority. By default, PRTG sensors are sorted first by priority and then alphabetically by name in lists like "Alarms" or "Sensors".

The default priority is three stars ("***") so you can prioritize objects in your configuration quickly. Simply left click an object and select the desired setting from the context menu:



The basic idea of the priority concept is ensure that the most important sensors are always shown first in the sensors and alarms lists. This guarantees you never miss an important outage.

Favorite Sensors

Another method to highlight important sensors is to mark them as "favorite" sensors, also accessible through a sensor's context menu. A list of the favorite sensors can be found on the Dashboard page ("Home|Dashboard") and in the Sensors menu ("Sensors|Favorite").

4.7 Default Values

For most settings, PRTG includes a set of default values which enables you to get started with the software immediately.

For example, the following settings will be inherited by all sensors from the "Root Group":

- Default monitoring interval of one minute.
- SNMP version 1 with "public" community string (default values for most devices).
- Various SNMP compatibility options.
- Various channel unit configurations.
- No schedule, no dependency, no Windows authentication account.

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Additionally, these default entries are set up automatically:

- One user group (PRTG Users) that should be used for non-admin users.
- One notification (email to the system admin).
- Various web interface settings (refresh, auto folding, etc).
- A set of schedules.
- Various data purging settings.

You may need to change a number of these default entries as you become used to the interface, however, these settings should initially suffice for most situations.

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Part V

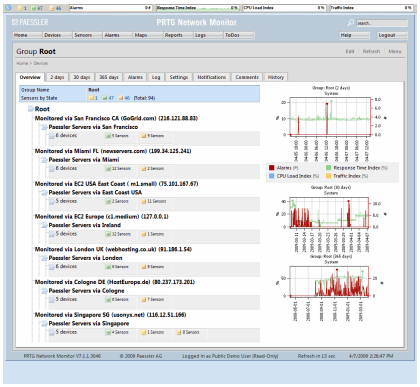
User Interfaces

5 User Interfaces

PRTG Network Monitor includes three user interface elements:

Web Based User Interface

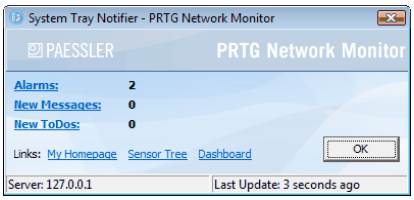
The main interface is a browser-based interface which is used to configure the software, set up sensors, review current status and create reports. Here is a screenshot:



Read more about it in sections Web Interface Navigation.

Windows Tray Tool

The System Tray Notifier runs on your PC in the background and will notify you with popups and sounds whenever PRTG discovers changes to your network.



Read more about the System Tray Notifier.

iPhone Interface

If you have an iPhone you can access a user interface that is optimized for the device:

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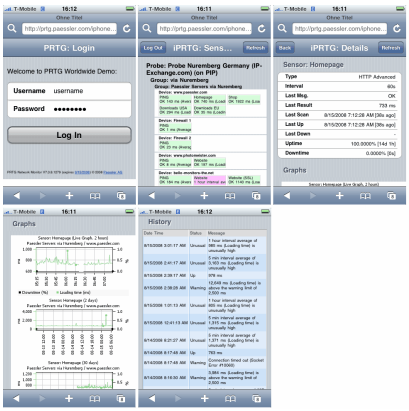
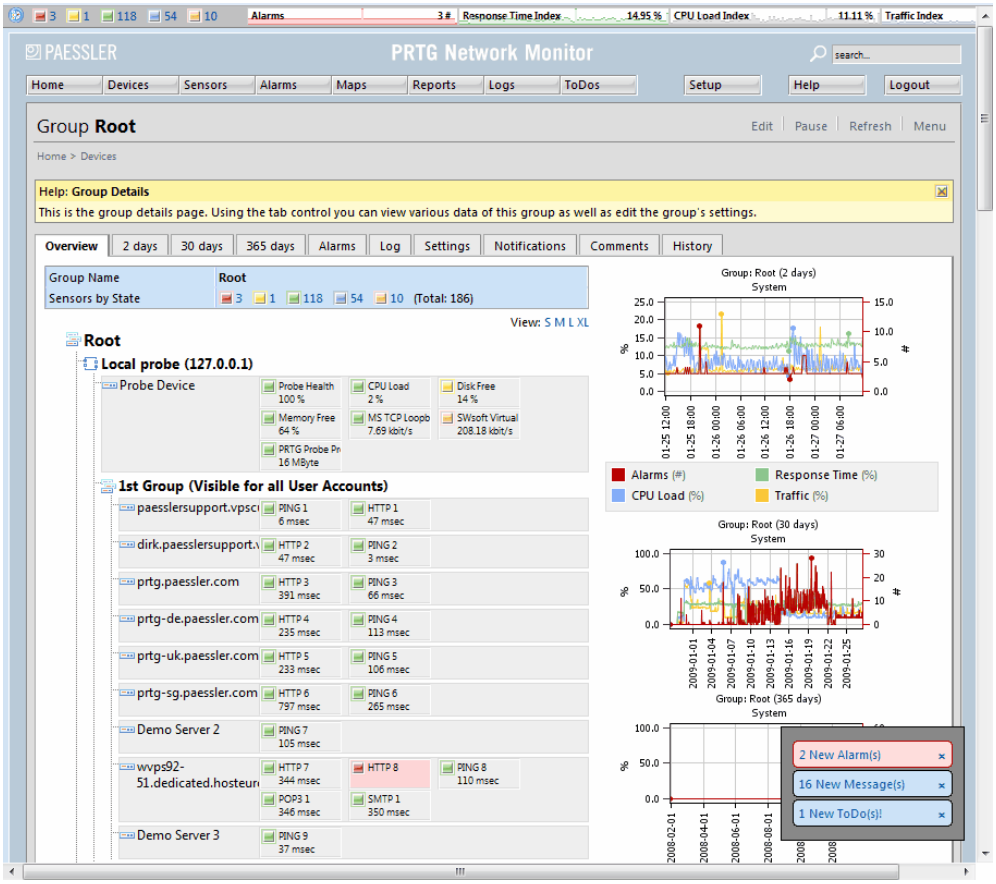


Read more about the iPhone User Interface.

5.1 Web Interface Navigation

Please have look at this screenshot of PRTG's web interface:



The main layout consists of a status bar at the top, the header area with the main menu and quick-search box below it and, finally, the main page content (all these elements are described in the next section).

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When you navigate through PRTG's web interface you will always use one of the following five navigational paths:

- The "Main Menu" provides access to many important aspects of the software
- The "Quick Search" is often the fastest way to navigate to an object
- Using the page's "Tabs" you can switch between various sub-pages for an object
- Many objects offer a "Context Menu" that will pop up when you right-click them
- And, finally, you are able to drill down into the object hierarchy of probes, groups, devices and sensors in the object tree shown above by merely clicking an object

These five navigation paths put PRTG's complete functionality at your fingertips. Quite likely you are already familiar with these techniques from many other websites and web-based user interfaces - with the exception of the context menus which are not commonly found on web-based user interfaces. However, after a short while you will understand what a powerful feature these context menus are when it comes to effectively navigating the interface.

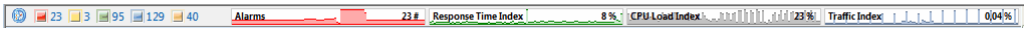
Read more here:

- Web Page Overview
- Context Menus
- Lists
- Monitoring Status Information Available Through the Web Interface

5.2 Web Page Overview

Let's have a detailed look at PRTG's webpages building blocks:

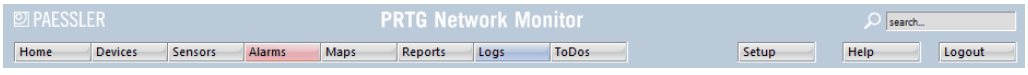
Global Status Bar



This bar is always shown above all pages. It shows the aggregated status of all sensors you have configured for monitoring. Depending on the sensors' status you will see colored squares with numbers (in the screenshot above, 23 sensors are in error (red), 3 show a warning state (yellow), 95 sensor show "OK" status (green), 129 sensors are paused (blue) and 40 sensors have an "UNUSUAL" status (orange).

The four graphs show the number of alarms as well as three "Index Graphs" for bandwidth usage, request time and CPU usage for all sensors over the last 24 hours. These graphs are "index" graphs, similar to a stock index. The values are based on the readings of all sensors or a group or device and are computed by using statistical computations and by comparing the values to the highest and lowest readings ever recorded. For example, a CPU Load Index value of 90% means that the average CPU load for all CPU sensors of your current configuration lies at 90% of the highest ever measured CPU usage value.

Website Header Area, Search Box and Main Menu



Navigating through the web interface is performed using the main menu. Please take a few minutes to familiarize yourself with all menu items and sub-items.

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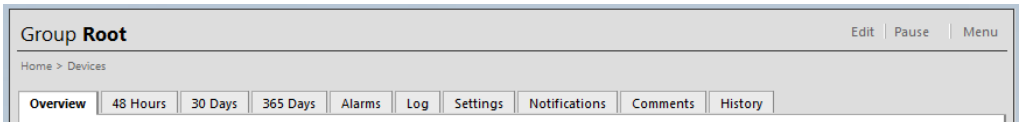
Menu item "Alarms" is highlighted with red color whenever there are alarms. "Logs" and "ToDos" are highlighted with blue color if new messages or new ToDos are available.

To search for any monitoring object, simply enter the name, part of the name, an IP address, a DNS name or a tag in the search box on the right and hit the enter key. A web page with all items that fit the search term will be returned - even displaying online help articles.

Page Header and Tabs



The individual page content starts below the website header area. Depending on the page's content you will see a menu and a few action links on the right. "Breadcrumbs" that will always show the path back to the homepage can be found below the heading.

Many pages have a tab-like interface. Using these tabs you can navigate to various sub-pages for an object:

"Overview" tab	All monitoring objects offer this tab providing a quick overview of all parameters and status
"Live Data", "48 Hours", "30 Days", "365 Days" tabs	These three or four tabs show the group's, device's or sensor's historical graphs and data tables (note: live data is only available for sensors)
"Alarms" and "Log" tab	Shows a list of current alarms and historic events for an object (and its child objects)
"Settings" and "Notifications" tab	Allows you to edit an object's settings and notifications
"Comments" tab	Provides a notepad for your own comments
"History" tab	Shows a lifetime log for each object (who created it, who edited it, etc.)

Please note that you will also see other tabs for other objects.

Overview Page for Groups, Devices and Sensors

Have a look at the following three screenshots showing the "Overview" tab of a group, a device and a sensor:

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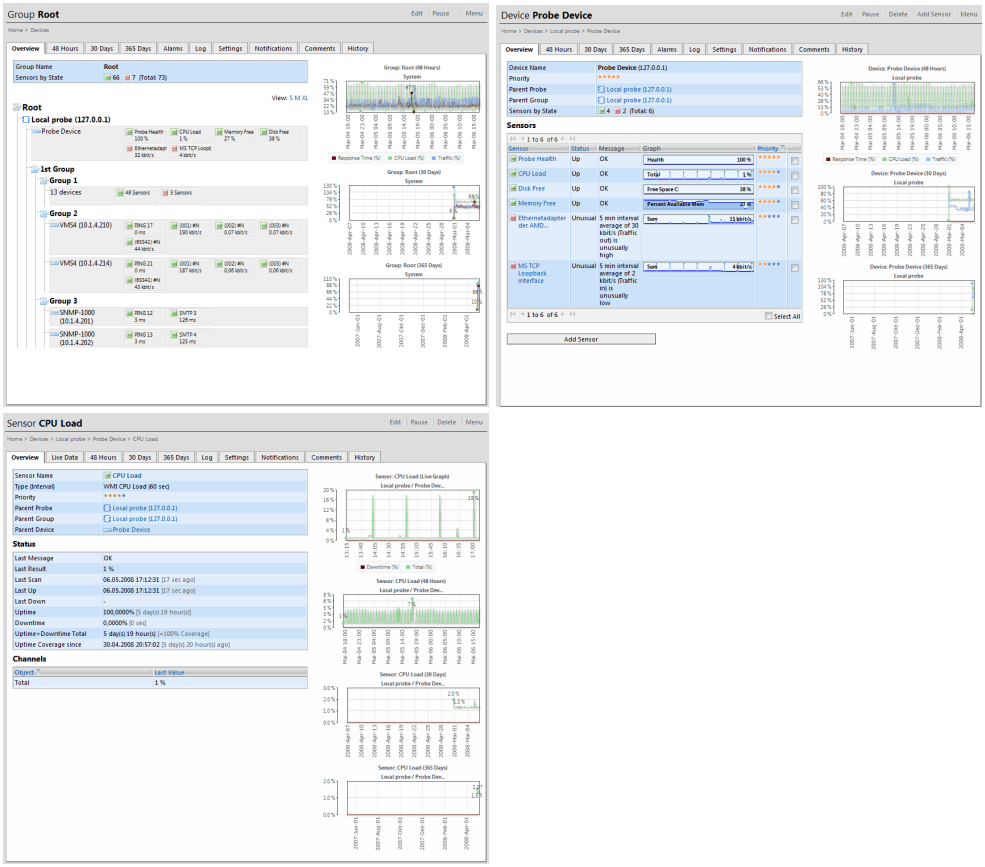

You can see that all three share a common layout:

- On the upper left you have the object's name, basic settings and sensor status.
- Below that there is a list of child objects (devices for a group, sensors for a device and channels for a sensor).
- On the right there are three or four graphs showing recent history. To zoom into a graph, simply click on it (or choose the appropriate tab).

For sensors you will see four graphs that show all "channels" of the sensor for the last 48-hours, last 30 days and last 365 days plus a live graph. For groups and devices there are three graphs that show the alarms, CPU load index, traffic index and response time index (explained above) for the last 48-hours, last 30 days and last 365 days.

How PRTG computes CPU Index, Traffic Index and Response Time Index for Your Network

In order to provide graphs that show a quick status overview of your complete network (or a part of it) PRTG computes so-called “index” values based on the measurements of all sensors. The “index” graphs are synthetic values between 0% and 100% based on current sensor measurements and their historic maximum values. The calculation of these index values works similar to a stock index which is computed using the current values of selected stocks. For each group and device PRTG shows four values in a graph. They are based on the measurements of all sensors in that group (or device). The “Alarms” graph simply shows the number of alarms at a given moment in history. Then there are three index values: "Response Time Index", "CPU Load Index", and "Traffic Index".

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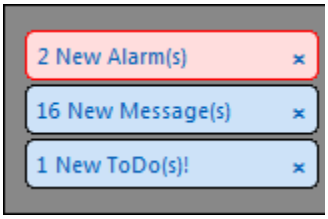
A CPU Load Index value of 10% for a group means that the average CPU load for all CPU sensors of this group currently is at 10% of the highest ever measured CPU usage value of that group. For response times usually the historic maximums are much higher than the average value. E.g. for pings in a LAN a “normal” time might be 2-10ms while a maximum of several hundred Milliseconds is not unusual. This is the reason that most Response Time Index readings are usually between 10% and 20%.

How does it work?

- During the normal network monitoring process PRTG records the highest value ever measured for each sensor
- The current measured value is weighted with this boundary values to compute an index value for a sensor between 0% and 100%
- For each device the index values for CPU load sensors, traffic sensors and sensors that measure response times are combined
- For each groups the index values of all devices are combined
- Keep in mind that changing the sensor setup (i.e. the number and types of sensors) will also inevitably change the index values because the numerical base for the calculation changes. This means that value before and after a configuration change may not be comparable at all. The same applies to situations where one or more sensors can not be monitored (e.g. when a probe is disconnected).

Box with Alerts

Every time a new event occurs while you are logged into the web interface of PRTG Network Monitor a box with alerts will show up in the lower right corner of your browser window:



Please keep an eye on these important messages which PRTG will display as it discovers changes in the network or requires your attention for other reasons. Simply click the text inside the red bar to navigate to the detailed information page or click one of the "x" symbols to dismiss and hide the alert. In the user account settings you can control which events trigger the popup.

5.3 Context Menus

Although context menus may seem unusual for a web-based application, they are the key to user interface's ease of use. Almost all objects that appear as links in the user interface will show a context menu when your right-click them.

Here are three sample context menus (for group, device and sensor). They are similar to any other context menu in a Windows environment:

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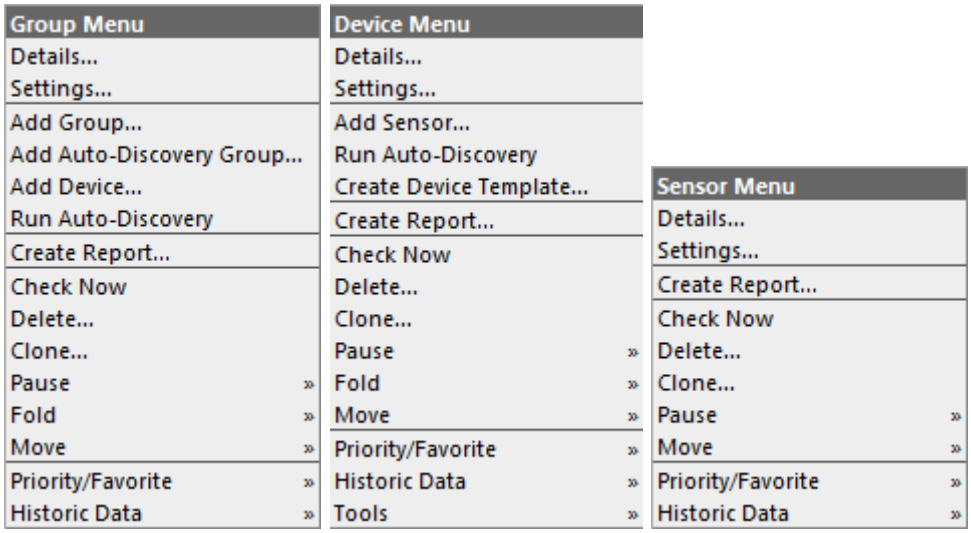
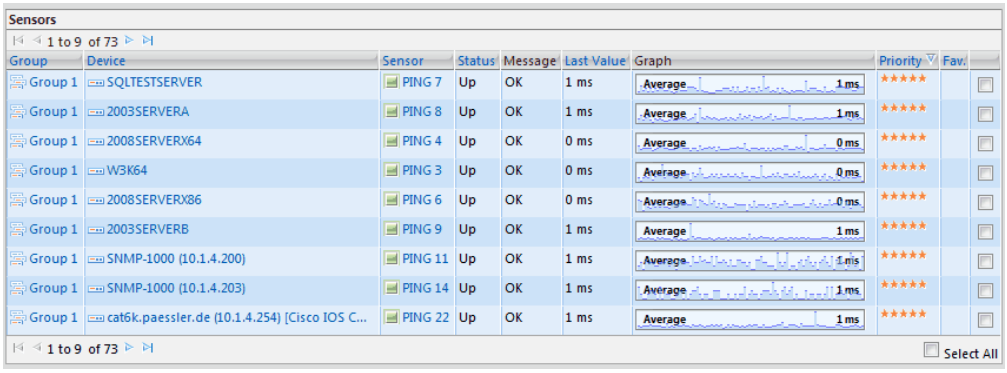
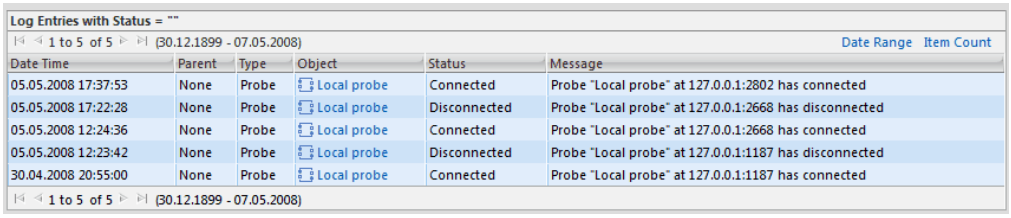


Note: If you want to access the browser's own context menu, hold the CTRL key down when right-clicking.

5.4 Lists

Throughout the web interface you will see lists of items which share common features and functions. Here are two sample lists (sensors and log entries):


Sensors
1 to 9 of 73
Group Device Sensor Status Message Last Value Graph Priority Fav.
Group 1 SQLTESTSERVER PING 7 Up OK 1 ms
Group 1 2003SERVERA PING 8 Up OK 1 ms
Group 1 2008SERVERX64 PING 4 Up OK 0 ms
Group 1 W3K64 PING 3 Up OK 0 ms
Group 1 2008SERVERX86 PING 6 Up OK 0 ms
Group 1 2003SERVERB PING 9 Up OK 1 ms
Group 1 SNMP-1000 (10.1.4.200) PING 11 Up OK 1 ms
Group 1 SNMP-1000 (10.1.4.203) PING 14 Up OK 1 ms
Group 1 cat6k.paessler.de (10.1.4.254) [Cisco IOS C... PING 22 Up OK 1 ms
1 to 9 of 73
Select All


Log Entries with Status = ""
1 to 5 of 5 (30.12.1899 - 07.05.2008)
Date Range Item Count
Date Time Parent Type Object Status Message
05.05.2008 17:37:53 None Probe Local probe Connected Probe "Local probe" at 127.0.0.1:2802 has connected
05.05.2008 17:22:28 None Probe Local probe Disconnected Probe "Local probe" at 127.0.0.1:2668 has disconnected
05.05.2008 12:24:36 None Probe Local probe Connected Probe "Local probe" at 127.0.0.1:2668 has connected
05.05.2008 12:23:42 None Probe Local probe Disconnected Probe "Local probe" at 127.0.0.1:1187 has disconnected
30.04.2008 20:55:00 None Probe Local probe Connected Probe "Local probe" at 127.0.0.1:1187 has connected
1 to 5 of 5 (30.12.1899 - 07.05.2008)

The following functions are available for lists:

- Paging: Use the small triangular icons at the top or bottom to walk through a list page by page.
- Sorting: You can re-sort a list by clicking the header of the column you want to use as sorting index.

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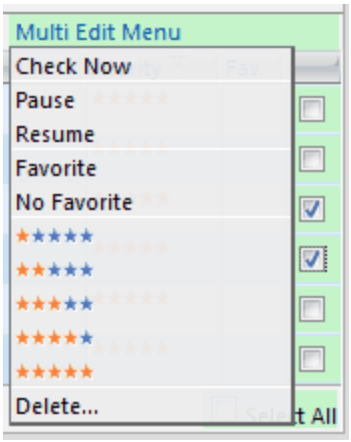
- Date Range: When viewing log lists, you can click on "Date Range" to change the desired date range.
- Item Count: Some lists offer the possibility to change the number of entries in the list by clicking on "Item Count".
- Multi Edit: Some lists offer a column of checkboxes. As soon as you select one or more checkboxes, an additional menu will offer functions that will be applied to all items in the lists whose checkboxes have been selected. Here is a sample screenshot of this menu:



5.5 Monitoring Status Information Available Through the Web Interface

As soon as the monitoring system is running, PRTG provides a wealth of information about the current status of the system.

A sensor's status is shown by of the following messages and colors:

- OK (Green): Sensor is running well, measured values are OK.
- WARNING (Yellow): Sensor is slow or the measured value is below/above a user-defined warning threshold.
- ERROR (Red): Sensor can not be monitored (e.g. device is down) or the measured value is below/above a user-defined error threshold.
- PAUSED (Blue): Sensor has been paused by the user or due to a dependency or schedule.
- UNUSUAL (Orange): Sensor is running well but recent values are unusually high or low (PRTG calculates this by applying statistical analysis on the recent measurements and the historic data of a sensor).
- UNKNOWN (black): Sensor has not been checked recently, e.g. shortly after starting the program or when the associated probe is unavailable.

The web interface provides in-depth information for each sensor:

- 4 graphs (live data, last two hours, last 48-hours, last 30 days, last 365 days).
- 4 data tables (one for each graph).
- Toplists of Top Talkers, Top Connections, Top Protocols, etc. (Packet Sniffing and NetFlow sensors only)
- Current status and error message (if available).
- Last measured value for each channel.
- Aggregated uptime and downtime.
- Last good request, last failed request.

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- Coverage (% of time monitoring information is available)
- Sensor's editing history (which user has changed what settings).
- Sensor activity log.
- User comments.

Current sensor and device status can be reviewed in numerous ways:

- "Sensor Tree": a hierarchical view with a tree-like display of all groups, devices and sensors.
- "Lists": various lists of sensors.
- "Alarms": a list of all sensors showing an error state, a warning state or unusual values.
- "Dashboard": a quick overview of the most important lists (alarms, recent log entries, favorite sensors status, recent ToDos).
- "Maps": You can create your own overviews and dashboards for your monitored network.

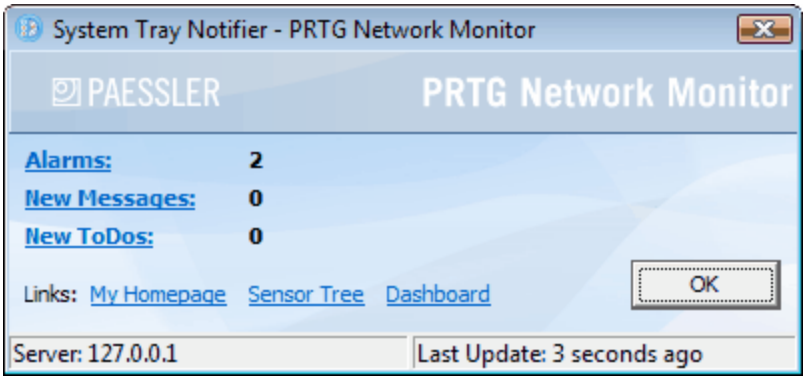
You can review the status of sorted sensors and filtered lists based on various parameters (e.g. sensor type, tag, device, status, measured value, etc).

- Various Top 10 lists.
- Best/worst availability.
- Fastest/slowest PING.
- Highest/lowest bandwidth usage.
- Fastest/slowest website.
- Highest/lowest CPU usage.
- Highest/lowest available disk space.

Graphs for groups and devices show the alarms, a "bandwidth index", "speed index" and a "CPU load index" for the associated sensors. These values are calculated using a sophisticated algorithm that merges the data of various sensor types into one graph showing a rough overview of how the sensors of the group/device behaved recently. These graphs are quite helpful to discern unusual network behavior.

5.6 System Tray Notifier

The System Tray Notifier runs on your PC in the background and will notify you with popups and sounds whenever PRTG discovers changes in your network.



It is automatically installed on the computer where you have installed PRTG. To use the Tray Tool on other computers, simply download and install the software from PRTG's web interface (select menu item "Setup| Downloads").

Start the software and you will see a PRTG icon in the Windows System Tray in the lower right corner of your

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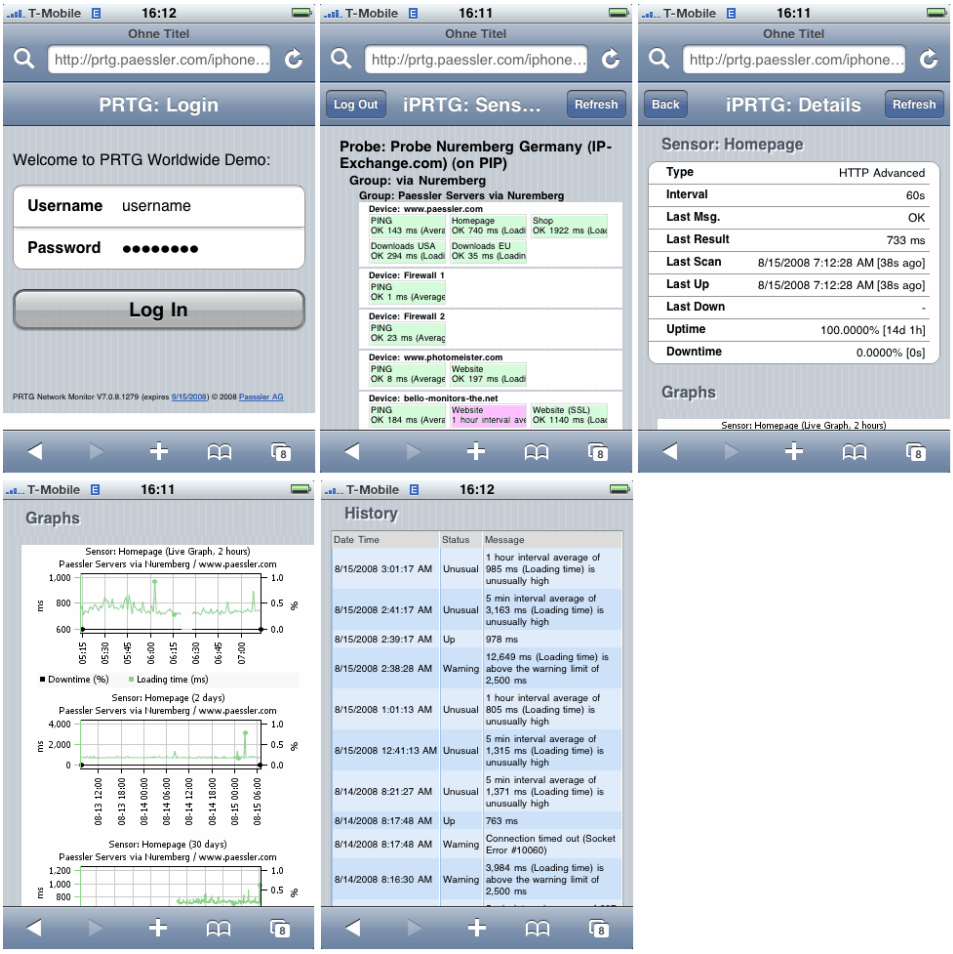
screen. To configure the software, please right click the icon and choose "Options". Enter your account credentials and the DNS name of your PRTG server. The program will now run in the background and will show a popup, play a sound or show a blinking tray icon to notify you about alarms, messages or ToDos.

5.7 iPhone User Interface

PRTG Network Monitor offers a user interface that is optimized for the Apple iPhone. This feature enables the user to quickly check the status of the servers and sensors remotely. It looks like this:



Simply point the Safari browser of your iPhone to the URL https://(your_prtg_server)/iphone and you will see the login dialog. Enter your credentials and a few seconds later you will see the sensor tree with groups, devices and sensors on the iPhone display. Tap on a sensor and you will receive a display with detailed information about the sensor, recent graphs logfile entries.

Currently the iPhone interface is "read only" (you can only monitor status).

Please keep the following security aspects in mind:

- You could also use HTTP to connect to your server, but encrypted access with SSL/HTTPS is recommended in order to keep your password secure.

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- As an added level of security you could create a user just for your iPhone logins that only has read access for the “Root Group” or for selected groups that you want to monitor remotely (in case you have more than a few sensors).

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Part VI

Sensor Setup

6 Sensor Setup

Before starting to create sensors, review the "Root Group's" settings that will be inherited by all other objects (see Setting Base Settings for Your Network).

As soon as this step is completed you can start to create new sensors to monitor your network. This can be done either manually or automatically using the Auto Discovery. The following sections explain these steps.

Note: If you want to create a multi-probe setup, you need to add and configure the necessary probes first (see Multiple Probes and Remote Probes).

6.1 Reviewing Settings of the Root Group

Objects in the sensor tree inherit many settings from their parent objects as explained in the Inheritance section. Obviously, the "Root Group", which is the parent object to all other objects, is especially important in this regard.

So, before you create your own sensors, it is a good idea to review the Root Group's settings to ensure they suit your network. Choose the "Devices" item from the main menu and click the "settings" tab. There are several relevant settings:

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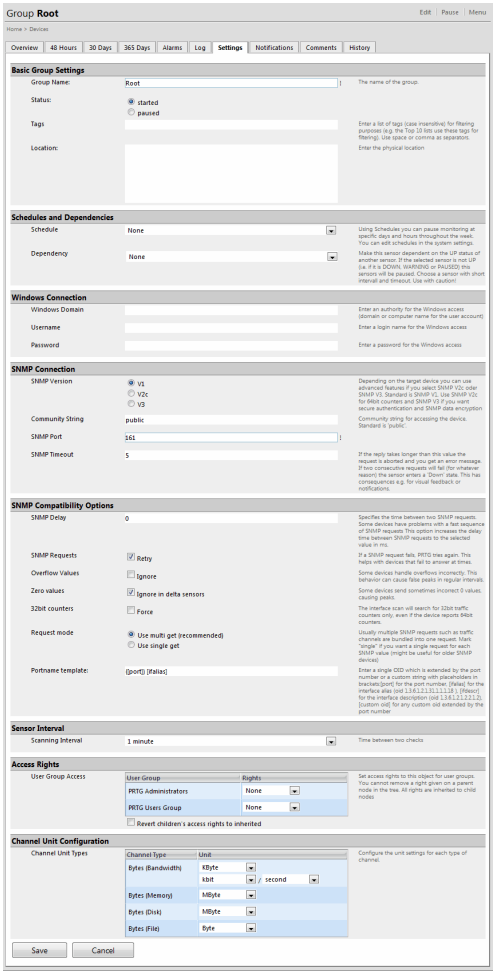

Please review the settings and refer to the help texts on the right for detailed explanations for each of them. Remember that you can override these settings for all child objects later.

There are the following sections:

- Credentials for Windows Systems: The Active Directory user account provided here will be used for all WMI-based monitoring and during the Auto Discovery process. It is recommended to enter a user account with administrator privileges.
- Credentials for VMware Servers: If you want to work with VMware ESX servers or VMware Virtual Centers please provide the necessary user account which will be used for auto discovery and for monitoring.
- Credentials for SNMP Devices and SNMP Compatibility Options: Please select the SNMP version and enter the necessary authentication strings used in your network. The defaults are "SNMP V1", community string "public" and port 161.
- Scanning Interval: Please select the default interval that shall be used for monitoring by all sensors.
- Unusual Detection: You can enable/disable the unusual detection.
- Access Rights: Use these settings to define which user group may view or edit objects.
- Channel Unit Configuration: Configure the unit settings for each channel type.

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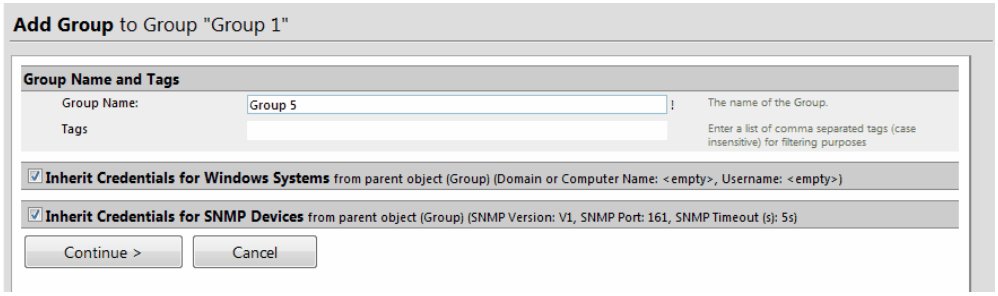
6.2 Creating Groups, Devices and Sensors Manually

Creating Groups

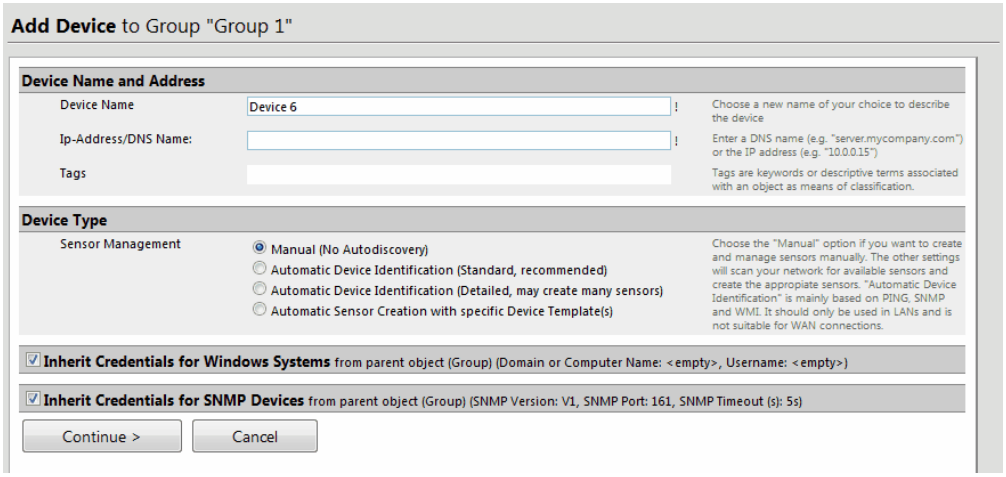
To create new groups go to the devices list ("Devices" under the main menu) and either choose a probe or group that is intended to contain the new group. Right click the object and then choose "Add Group" from the context menu. As an alternative you can choose "Add Group" from the "Devices" menu - in the latter case you must choose a parent group.


Add Group to Group "Group 1"
Group Name and Tags
Group Name:
Group 5
The name of the Group.
Tags
Enter a list of comma separated tags (case insensitive) for filtering purposes
Inherit Credentials for Windows Systems from parent object (Group) (Domain or Computer Name: <empty>, Username: <empty>)
Inherit Credentials for SNMP Devices from parent object (Group) (SNMP Version: V1, SNMP Port: 161, SNMP Timeout (s): 5s)
Continue >
Cancel

Enter a name for the new group, optionally review the inherited credential settings and then click "Continue".

Creating Devices

To create a new device, right-click a device and select "Add Device" from the context menu. As an alternative you can choose "Add Device" from the "Devices" menu - in the latter case you will be asked for a parent group.


Add Device to Group "Group 1"
Device Name and Address
Device Name
Device 6
Choose a new name of your choice to describe the device
Ip-Address/DNS Name:
Enter a DNS name (e.g. "server.mycompany.com") or the IP address (e.g. "10.0.0.15")
Tags
Tags are keywords or descriptive terms associated with an object as means of classification.
Device Type
Sensor Management
Manual (No Autodiscovery)
Automatic Device Identification (Standard, recommended)
Automatic Device Identification (Detailed, may create many sensors)
Automatic Sensor Creation with specific Device Template(s)
Choose the "Manual" option if you want to create and manage sensors manually. The other settings will scan your network for available sensors and create the appropiate sensors. "Automatic Device Identification" is mainly based on PING, SNMP and WMI. It should only be used in LANs and is not suitable for WAN connections.
Inherit Credentials for Windows Systems from parent object (Group) (Domain or Computer Name: <empty>, Username: <empty>)
Inherit Credentials for SNMP Devices from parent object (Group) (SNMP Version: V1, SNMP Port: 161, SNMP Timeout (s): 5s)
Continue >
Cancel

There are two settings that you must enter for a device: The name and the IP address (or DNS name). Optionally, review the inherited credentials and then click "Continue".

Creating Sensors

In order to create new sensors, right-click on the device where the new sensor is to be added and choose "Add Sensor" from the context menu. As an alternative you can choose "Add Sensor" from the "Sensors" menu - in the

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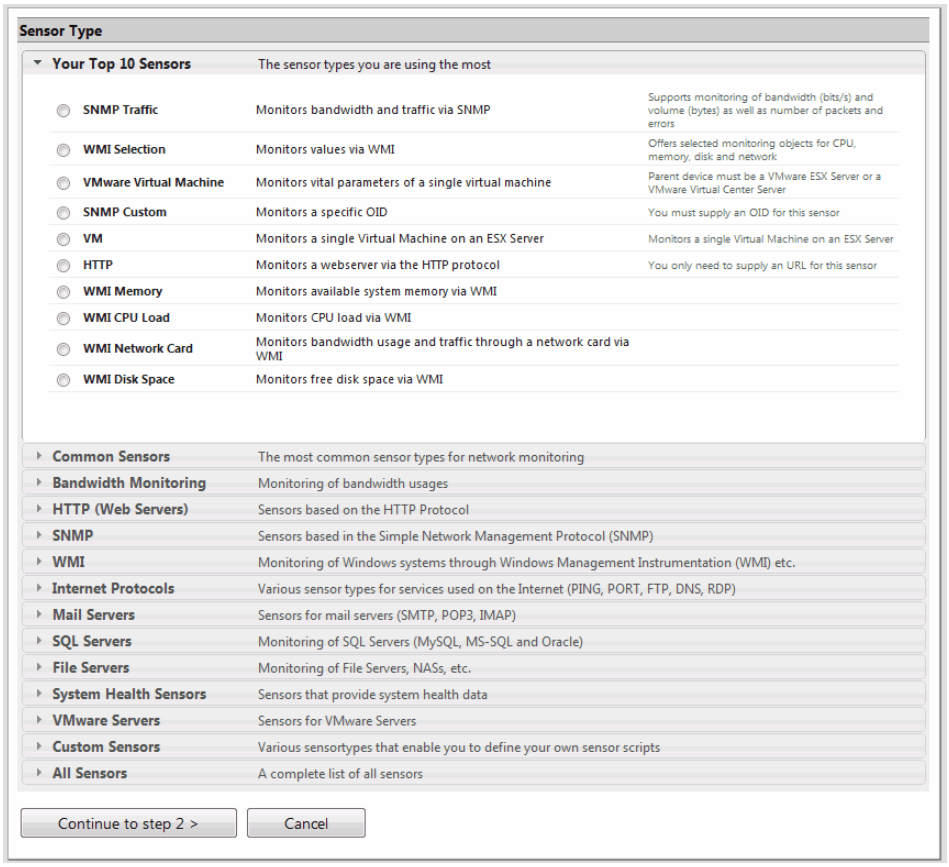
latter case you will be asked for a parent device.

Creating new sensors involves two steps: First, you must select a sensor type, then - after some preparations by PRTG - you need to specify the sensor settings.


Sensor Type
Your Top 10 Sensors
The sensor types you are using the most
SNMP Traffic
Monitors bandwidth and traffic via SNMP
Supports monitoring of bandwidth (bits/s) and volume (bytes) as well as number of packets and errors
WMI Selection
Monitors values via WMI
Offers selected monitoring objects for CPU, memory, disk and network
VMware Virtual Machine
Monitors vital parameters of a single virtual machine
Parent device must be a VMware ESX Server or a VMware Virtual Center Server
SNMP Custom
Monitors a specific OID
You must supply an OID for this sensor
VM
Monitors a single Virtual Machine on an ESX Server
Monitors a single Virtual Machine on an ESX Server
HTTP
Monitors a webserver via the HTTP protocol
You only need to supply an URL for this sensor
WMI Memory
Monitors available system memory via WMI
WMI CPU Load
Monitors CPU load via WMI
WMI Network Card
Monitors bandwidth usage and traffic through a network card via WMI
WMI Disk Space
Monitors free disk space via WMI
Common Sensors
The most common sensor types for network monitoring
Bandwidth Monitoring
Monitoring of bandwidth usages
HTTP (Web Servers)
Sensors based on the HTTP Protocol
SNMP
Sensors based in the Simple Network Management Protocol (SNMP)
WMI
Monitoring of Windows systems through Windows Management Instrumentation (WMI) etc.
Internet Protocols
Various sensor types for services used on the Internet (PING, PORT, FTP, DNS, RDP)
Mail Servers
Sensors for mail servers (SMTP, POP3, IMAP)
SQL Servers
Monitoring of SQL Servers (MySQL, MS-SQL and Oracle)
File Servers
Monitoring of File Servers, NASs, etc.
System Health Sensors
Sensors that provide system health data
VMware Servers
Sensors for VMware Servers
Custom Sensors
Various sensortypes that enable you to define your own sensor scripts
All Sensors
A complete list of all sensors
Continue to step 2 >
Cancel

In step one you must select a sensor type from the available types list. There are more than 40 different types (see Sensor Types for detailed descriptions), so PRTG offers various groupings. Simply click one of the group headings and then select a sensor type. Then click "Continue to Step 2".

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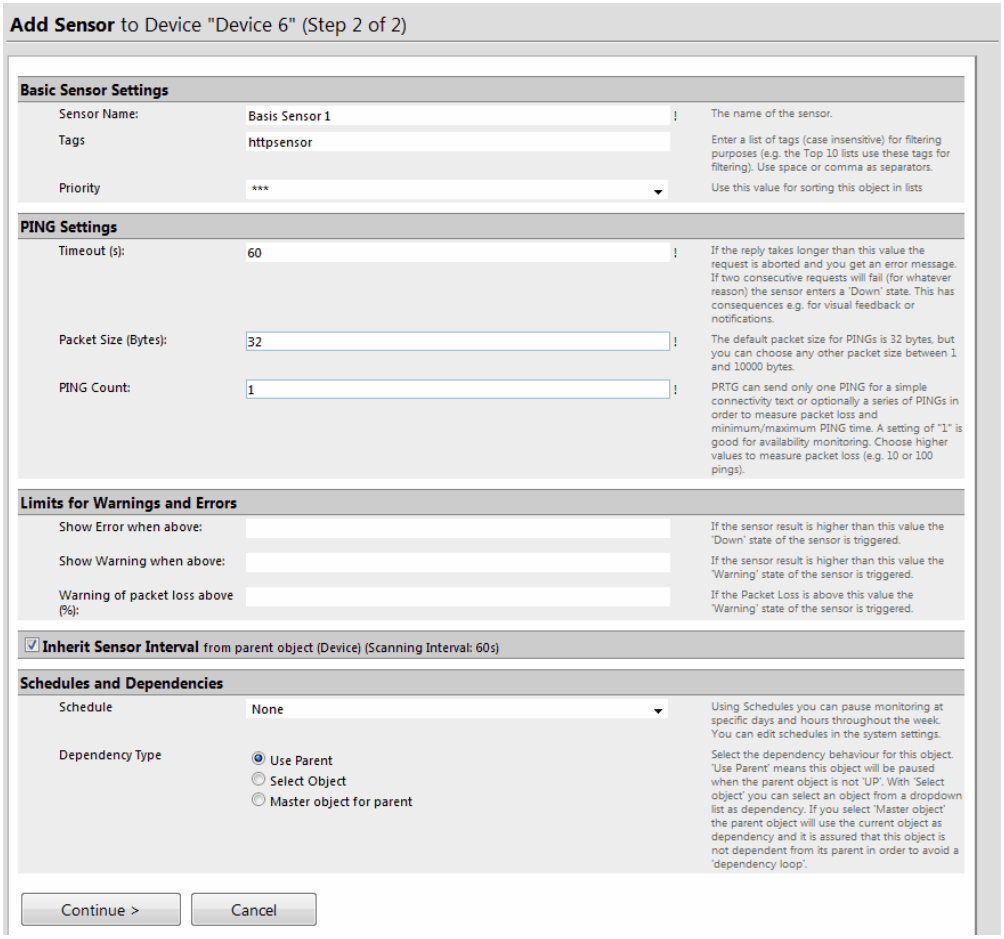
Add Sensor to Device "Device 6" (Step 2 of 2)
Basic Sensor Settings
Sensor Name:
Basis Sensor 1
The name of the sensor.
Tags
httpsensor
Enter a list of tags (case insensitive) for filtering purposes (e.g. the Top 10 lists use these tags for filtering). Use space or comma as separators.
Priority
***
Use this value for sorting this object in lists
PING Settings
Timeout (s):
60
If the reply takes longer than this value the request is aborted and you get an error message. If two consecutive requests will fail (for whatever reason) the sensor enters a 'Down' state. This has consequences e.g. for visual feedback or notifications.
Packet Size (Bytes):
32
The default packet size for PINGs is 32 bytes, but you can choose any other packet size between 1 and 10000 bytes.
PING Count:
1
PRTG can send only one PING for a simple connectivity text or optionally a series of PINGs in order to measure packet loss and minimum/maximum PING time. A setting of "1" is good for availability monitoring. Choose higher values to measure packet loss (e.g. 10 or 100 pings).
Limits for Warnings and Errors
Show Error when above:
If the sensor result is higher than this value the 'Down' state of the sensor is triggered.
Show Warning when above:
If the sensor result is higher than this value the 'Warning' state of the sensor is triggered.
Warning of packet loss above (%):
If the Packet Loss is above this value the 'Warning' state of the sensor is triggered.
Inherit Sensor Interval from parent object (Device) (Scanning Interval: 60s)
Schedules and Dependencies
Schedule
None
Using Schedules you can pause monitoring at specific days and hours throughout the week. You can edit schedules in the system settings.
Dependency Type
Use Parent
Select Object
Master object for parent
Select the dependency behaviour for this object. 'Use Parent' means this object will be paused when the parent object is not 'UP'. With 'Select object' you can select an object from a dropdown list as dependency. If you select 'Master object' the parent object will use the current object as dependency and it is assured that this object is not dependent from its parent in order to avoid a 'dependency loop'.
Continue >
Cancel

In step two the settings available depend on the sensor type. Please review the settings and make any necessary changes, then click "save". The new sensor will start monitoring right away.

6.3 Creating Devices and Sensors Using the Auto Discovery

PRTG's Auto Discovery is a great way to automatically create a sophisticated and concise set of sensors for your complete network. It is mainly suitable for LAN discovery since it involves a lot of SNMP and WMI.

How it works

PRTG's Auto Discovery process has three stages:

- Step 1: Scanning a network segment for devices using PINGs (for groups only).
- Step 2: Assessing the device type for all devices discovered in Step 1 (using SNMP, WMI and other protocols).
- Step 3a: Creating sensor sets that match the discovered device types of Step 2 (based on built-in device templates with recommended sensors for many device types).
- Step 3b (optional): Creating sensor sets using user created device templates (see Copying Devices by Cloning or Using Device Templates)

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The Auto Discovery can be used on a group level for a range of IP addresses, or for individual devices you might have created manually. It can be run just once, on demand via the context menu, or scheduled every hour, day or week. Running the Auto Discovery every day or week will automatically create new sensors when new devices are connected to the network. As soon as new devices or sensors are discovered, new "ToDos" are created and mailed to the system admin.

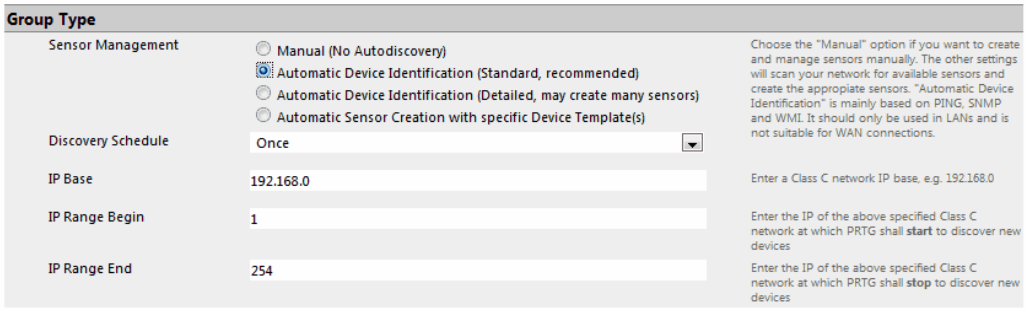
Please be aware of the following restrictions of the Auto Discovery:

- PRTG can not discover devices that can not be pinged since Step 1 uses PINGs (e.g. if a firewall blocks echo requests).
- You must supply authentication settings for SNMP, Windows/WMI and VMware servers in order to fully exploit the power of this feature.
- If a device has more than one IP address, it may show up more than once in the discovery results, even though PRTG tries to identify these situations.

Creating an Auto Discovery Group

Create a new group by right-clicking a probe, or group, and selecting "Add Auto-Discovery Group" from the context menu.

Enter a name for the group and choose the desired option for the "Sensor Management" setting:


Group Type
Sensor Management
Manual (No Autodiscovery)
Automatic Device Identification (Standard, recommended)
Automatic Device Identification (Detailed, may create many sensors)
Automatic Sensor Creation with specific Device Template(s)
Choose the "Manual" option if you want to create and manage sensors manually. The other settings will scan your network for available sensors and create the appropiate sensors. "Automatic Device Identification" is mainly based on PING, SNMP and WMI. It should only be used in LANs and is not suitable for WAN connections.
Discovery Schedule
Once
IP Base
192.168.0
Enter a Class C network IP base, e.g. 192.168.0
IP Range Begin
1
Enter the IP of the above specified Class C network at which PRTG shall start to discover new devices
IP Range End
254
Enter the IP of the above specified Class C network at which PRTG shall stop to discover new devices

You have four options:

- Manual (No Autodiscovery)
- Automatic Device Identification (Standard, recommended): This recommended option and should work fine for most installations.
- Automatic Device Identification (Detailed, may create many sensors): This option is only suitable for small network segments and whenever you want to monitor the maximum number of sensors available.
- Automatic Sensor Creation with specific Device Template(s): Choose this option if you do not want automatic device identification and would rather select the device templates manually, e.g. if you want to use a device template that you have created yourself. You will see a list of device templates from which you can select one or more templates.

Afterwards, enter the IP Base (the first 3 bytes of the IP Range) and the first and last 4th byte of the IP address range. As soon as you click on "continue", PRTG will start the discovery process, visible in the sensor tree ("Devices" menu item of the main menu):

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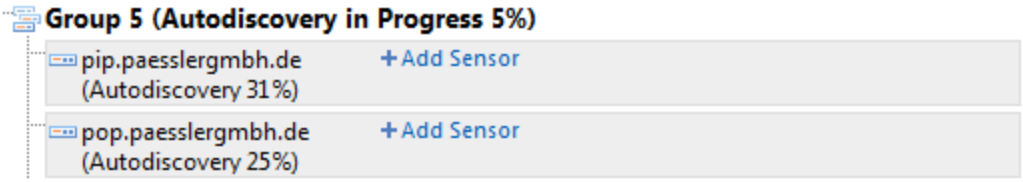
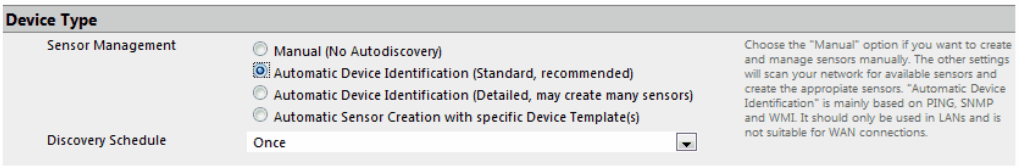


If you keep looking at this page, you will see more and more devices and sensors showing up in the list. The Auto Discovery process takes between 10 and 50 seconds per IP address, depending on the configuration and the network.

All sensors created by this process will start monitoring immediately and will notify failures as soon as they happen.

Creating an Auto Discovery Device

Creating sensors for just one device using the Auto Discovery function is quite similar to creating an auto discovery group. Create a new device by right-clicking a group and choosing "Add Device" from the context menu.


Device Type
Sensor Management
Manual (No Autodiscovery)
Automatic Device Identification (Standard, recommended)
Automatic Device Identification (Detailed, may create many sensors)
Automatic Sensor Creation with specific Device Template(s)
Choose the "Manual" option if you want to create and manage sensors manually. The other settings will scan your network for available sensors and create the appropiate sensors. "Automatic Device Identification" is mainly based on PING, SNMP and WMI. It should only be used in LANs and is not suitable for WAN connections.
Discovery Schedule
Once

Enter a name and IP address (or DNS name) for the device and choose one of the options for "Sensor Management" (described above).

As soon as you click "Continue" the device assessment will begin and create the sensors that suit the device.

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Part VII

Sensor Types

7 Sensor Types

PRTG offers more than 40 different sensor types for various network services. All sensor types have a number of type-specific settings plus there are a number of common settings for all sensors. Please refer to the help text in the web interface for a detailed description of all other settings.

Overview of Sensors

When creating new sensors you will see the following groups of sensor types. Note that some sensor types will show up several times in this list because they fit into more than one category:

- Common Sensors: The most common sensor types for network monitoring
- Bandwidth Monitoring: Monitoring of bandwidth usage using SNMP, WMI, NetFlow or Packet Sniffing
- HTTP (Web Servers): Sensors based on the HTTP Protocol
- SNMP: Sensors based on the Simple Network Management Protocol (SNMP)
- WMI: Monitoring of Windows systems through Windows Management Instrumentation (WMI)
- Internet Protocols: Various sensor types for services used on the Internet (PING, PORT, FTP, DNS, RDP)
- Mail Servers: Sensors for mail servers (SMTP, POP3, IMAP, SMTP&IMAP Round Trip, SMTP&POP3 Round Trip)
- SQL Servers: Monitoring of SQL Servers (MySQL, MS-SQL and Oracle)
- File Servers: Monitoring of File Servers, NASs, etc.
- System Health Sensors: Sensors that monitor the health of systems, e.g. disk temperature
- VMware Servers: Sensors for VMware Servers
- Custom Sensors: Various sensor types that enable you to define your own sensor scripts

7.1 SNMP Sensor Types

The Simple Network Management Protocol (SNMP) is the most basic method of gathering bandwidth and network usage data.

How SNMP Monitoring works

It can be used to monitor bandwidth usage of routers and switches on a port-by-port basis, as well as device readings such as memory, CPU load, etc.

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When this technology is used, PRTG queries the devices (e.g. routers, switches and servers) for the traffic counters of each port with quite small data packets. These are triggering reply packets from the device. Of the three methods, this option creates the least CPU and network load.

Reasons To Choose SNMP Monitoring

SNMP is the most commonly used method mainly because it is easy to set up and requires minimal bandwidth and CPU cycles. If your network devices support SNMP, and/or if you want to monitor large networks with several hundred or thousands of sensors, we recommend you start with SNMP.

Besides network usage monitoring, another well-known feature of SNMP is the ability to also watch other network parameters such as CPU loads, disk usage, temperatures, as well monitoring many other readings (depending on the device).

Network issues: In order to use SNMP for monitoring purposes, it is imperative that UDP packets are allowed to travel from the machine running PRTG, to the device you want to monitor and back, which is usually the case in LANs and Intranets. This is not usually the case for Internet connections, DMZ and WAN connections and some changes to the traversed firewalls may be necessary. Keep in mind that SNMP V1 and V2c are not secure protocols and should not be used across the Internet or insecure data connections. Only SNMP version 3 supports encryption.

SNMP Sensors Types

The following sensors use the Simple Network Management Protocol (supports SNMP V1, V2c and V3):

- SNMP Traffic: Supports monitoring bandwidth (bits/s) and volume (bytes), as well as the number of packets and errors via SNMP for a port or a network card on PCs, servers, switches, firewalls, printers.
- SNMP Custom: Monitors one specific OID supplied by the user.
- SNMP Library: SNMP libraries make it easy to create system-specific sensors based on MIBs (some are included and new ones can be created from standard SNMP MIB files using the free MIB importer tool, see below).

SNMP Version 1, 2c and 3

PRTG supports three versions of the SNMP protocol:

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SNMP Version 1: The oldest and most basic version of SNMP

- Pros: Supported by most SNMP-compatible devices; simple to set up.
- Cons: Limited security as it only uses a simple password (“community string”) and data is sent in clear text (unencrypted); should only be used inside LANs behind firewalls, not in WANs; only supports 32-bit counters which is not enough for high-load bandwidth monitoring (gigabits/second).

SNMP Version 2c: Adds 64-bit counters

- Pros: Supports 64-bit counters to monitor bandwidth usage in networks with gigabits/second loads.
- Cons: Limited security (same as with SNMP V1).

SNMP Version 3: Adds authentication and encryption

- Pros: Offers user accounts and authentication for multiple users and optional data packet encryption, increasing available security; plus all advantages of Version 2c.
- Cons: difficult to configure.

It is important to know that if you select an SNMP version which is not supported by the server or device you want to monitor, you will receive an error message. Unfortunately, most of the time these error messages do not explicitly mention the possibility of using the incorrect SNMP version. These messages provide minimum information such as “cannot connect” or similar. The same situation exists if community strings, usernames and passwords are incorrect.

SNMP Overload and Limitations of the SNMP System

SNMP V1 and V2 scale directly with the performance of the hardware and the speed of the network. In our labs we were able to monitor 30.000 SNMP V1 sensors at 60 second interval with one PRTG server (core and local probe) plus two remote probes (10.000 sensors on each probe).

But SNMP V3 has software dependent performance limitations due to the SSL encryption. For SNMP V3 we have measured request times between 10ms and 1000ms for SNMP V3 requests in our labs. All SNMP V3 requests in PRTG are performed serialized on each probe (i.e. one after the other) so you are able to monitor between 60 and 6000 SNMP V3 sensors with an interval of 60 seconds - depending on the request times in your network. Keep an eye on the "SNMP Interval Delay" channel of the "Probe Health" sensor. Values above 0% indicate that the SNMP requests cannot be performed at the desired interval.

If you run into SNMP Overload problems you have three options:

- Increase the monitoring interval of the SNMP V3 sensors
- Distribute the SNMP V3 sensors over two or more probes
- Switch to SNMP V1 or V2 if you can live without encryption

What is the “SNMP Community String”?

The “SNMP Community String” is similar to a user ID or password that allows access to a router's, or other device's, statistics. PRTG Network Monitor forwards the community string along with all SNMP requests. If the correct community string is provided, the device responds with the requested information. If the community string is incorrect, the device simply discards the request and does not respond. **Note:** SNMP community strings are only used by devices that support SNMPv1 and SNMPv2c protocols. SNMPv3 uses username/password authentication, along with an encryption key.

By convention, most SNMPv1-v2c equipment ships with a read-only community string set to "public". It is standard practice for network managers to change all the community strings to customized values within the

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device setup.

Tools

Paessler MIB Importer: Imports MIB (Management Information Base) files and converts them into OID libraries for use with PRTG Network Monitor.
http://www.paessler.com/tools/

Paessler SNMP Tester: SNMP Tester can run simple SNMP requests against a device in a network to debug SNMP requests down to the protocol level in order to find communication and/or data problems in SNMP monitoring configurations.
http://www.paessler.com/tools/

See also

Bandwidth Monitoring Sensor Type Comparison

7.2 WMI Sensor Types

Windows Management Instrumentation (WMI) is the base technology from Microsoft for monitoring and managing Windows-based systems. WMI allows access to data for many Windows configuration parameters, as well as current system status values. Access can be local or remote via a network connection. WMI is based on COM and DCOM and is integrated in Windows 2000, XP, 2003 and Vista (add-ons are available for Windows 9x and NT4).

In order to be able to monitor remote machines, PRTG's WMI sensor needs an Active Directory account to have access to the WMI interface. You can enter these credentials for the parent device or group. The sensor will then inherit these settings.

WMI Sensor Types

PRTG supports the following WMI based sensor types:

- WMI CPU Load: Measures CPU load of a system (total and per CPU).
- WMI Memory: Displays free system memory (MB and %).
- WMI Disk Space: Free disk space on fixed drives (MB and %, per drive).
- WMI Network Card: Measures traffic going through network cards.
- WMI Page File: Checks the usage of the Windows page file.
- WMI Service: Checks if a service is running and optionally restarts a service if it is not running.
- WMI Event Log Sensor: Monitors a system's application, system and security event log for specific events.
- WMI Process: Monitors one process via WMI.
- WMI File: Monitors file size and existence, as well as changes to a file via WMI.
- WMI Vital System Data: Users can select from more than 20 different vital Windows System parameters (CPU: Percent Processor Time, CPU: Processor Queue Length, CPU: Processor Percent Privileged Time, CPU: Processor Percent User Time, Thread Context Switches, Memory: Free Physical Memory, Memory: Total Visible Memory, Memory: Pages/sec, Memory: Page Faults/sec, Memory: Page Reads/sec, Memory: Page Writes/sec, Memory: Pool Non-paged bytes, Pagefile Usage, Disk: Percent Disk Time, Disk: Current Disk Queue Length, Disk: Reads/sec, Disk: Writes/sec, Network: Bytes Total/sec, Network: Bytes Received/sec, Network: Bytes Sent/sec, Server: Bytes Total/sec, Server: Bytes Received/sec, Server: Bytes Sent/sec, etc).

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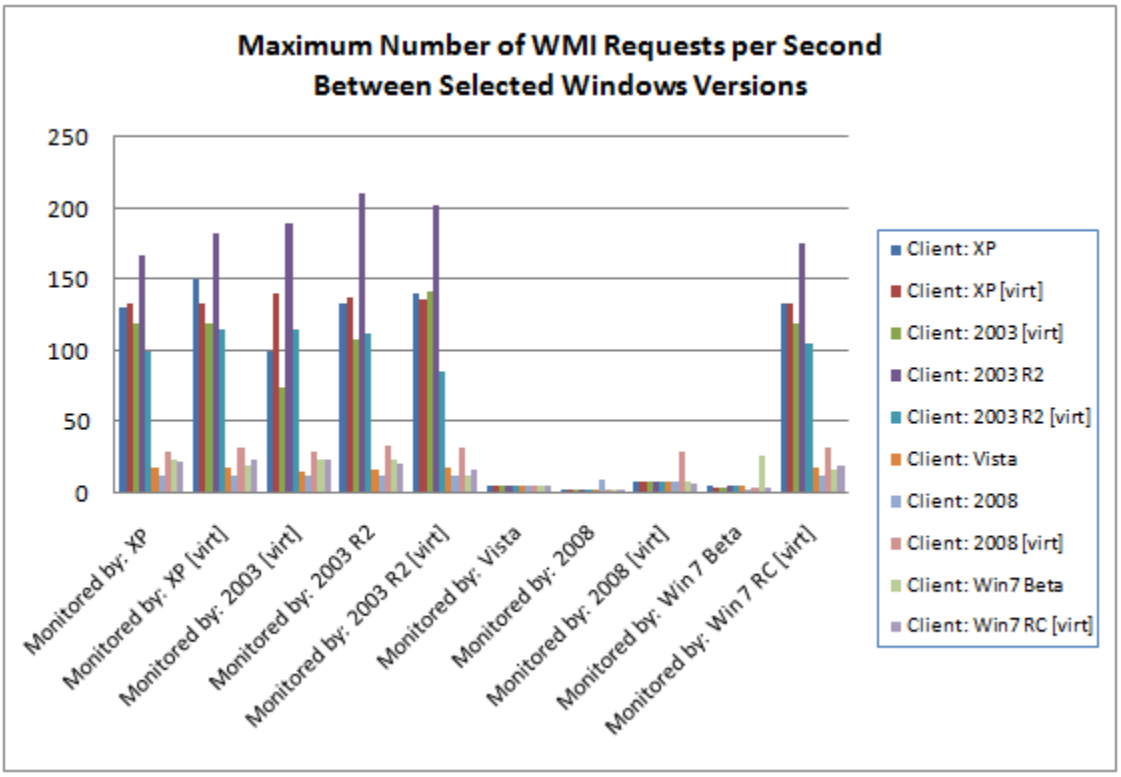
- WMI Exchange Server 2003: Monitors vital readings of an Exchange Server 2003.
- WMI Custom: Performs a custom WMI query.

Limitations of WMI on Windows Vista and Windows Server 2008

You should be aware that performance of WMI-based monitoring is drastically limited when the monitoring station or the monitored client runs on Windows Vista or Windows 2008. When it comes to network monitoring via WMI, Windows XP and Windows 2003 are up to 70 times faster than Windows 2008 or Vista. Here are some detailed results of our WMI tests on selected Windows versions:



The results of our tests are:

- On WinXP/Win2k3/Win7 you can run ~10,000 WMI sensors with one minute interval
- On Vista/Win2k8 you can run ~300 WMI sensors with one minute interval
- The more Vista/Win2k8/Win7 client systems you have in your network the more WMI monitoring performance will be affected
- System performance (CPU, memory, etc.) or virtualization does not strongly affect WMI monitoring performance

If you want to use WMI for network monitoring of more than 20-30 boxes please consider the following rules:

- Do not use Windows Vista or Windows 2008 as monitoring stations for WMI-based network monitoring
- If possible use Windows 2003 R2 Server for WMI based network monitoring (followed by XP and Windows 7)
- If you can't run PRTG on XP/Win2k3 consider setting up a remote probe with XP for the WMI monitoring (You still get far better WMI monitoring performance with a remote probe on a virtual machine running Windows XP or Win2k3 than on any bare metal system running Vista/Win2k8)
- Consider switching to SNMP-based monitoring for large networks. Using SNMP you can easily monitor 10 times as many nodes as with WMI (on the same hardware)

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Links to WMI related articles

Paessler's Guide to Troubleshooting WMI Problems
http://www.paessler.com/support/kb/prtg7/wmi_not_working/

Paessler WMI Tester - A useful freeware tool to test WMI connections. Tests the accessibility of WMI (Windows Management Instrumentation) counters in a quick and easy manner.
http://www.paessler.com/tools/wmitester

Microsoft: Windows Management Instrumentation Technical Articles: Managing Windows with WMI
http://msdn2.microsoft.com/en-us/library/ms811533.aspx

Microsoft: WMI Reference
http://msdn.microsoft.com/en-us/library/aa394572.aspx

See also

Bandwidth Monitoring Sensor Type Comparison

7.3 HTTP Sensor Types

The HTTP protocol (Hypertext Transfer Protocol) is most commonly used for the World Wide Web. Web browsers request web pages, graphics, etc from web servers using this protocol.

Common Parameters include:

- URL— the URL address of the web page to monitor (including the leading http://).
- Mode — the HTTP request mode to use (GET, POST, HEAD).
- POSTDATA — the data part when using the POST method.

For simple web pages, simply enter the URL (with http:// at the beginning) and keep the default mode selection of GET. If you want to monitor a URL for a POST form, you must select the POST method and enter the POSTDATA. The HEAD method only requests the HTTP header from the server without the actual web page. Although this saves bandwidth since less data is transferred, it is not recommended because the measured request time is not the one experienced by your users and you might not be notified for slow results or timeouts.

Note: If your network requires a proxy for HTTP requests or the URL requires authentication, you must use the HTTP Advanced Sensor.

Bandwidth Issues and Log File Analysis Issues

Important: Keep in mind that the HTTP sensor can create substantial bandwidth load since it is one of the sensors that transfers many bytes per requests (sometimes 1000 times more that a simple ping). So, choosing a URL that only provides a small HTML page in return is recommended if you have to pay for the bandwidth (either for your connection or for your web server). This is certainly not a major problem in most LANs and Intranets, but bandwidth usage should always be monitored. Requesting a 25kb web page with an interval of one minute creates a traffic of 36MB per day or more than one Gigabyte per month.

Also, keep in mind that the monitoring requests will show up in your web server log analysis (one month of

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monitoring with a one minute interval will create 43,200 requests). You should filter out the requests from PRTG when analyzing log files. Filtering can be done based on the IP address of the server running PRTG or by filtering requests from PRTG's browser agent:

```
Mozilla/5.0 (compatible; PRTG Network Monitor Vxxxx; Windows)
```

HTTP Sensor Types

PRTG offers the following HTTP-based sensors to monitor web servers:

- HTTP: Monitors a web server via the HTTP protocol.
- HTTP Advanced: Monitors a web server via the HTTP protocol with various advanced settings (e.g. to check the content of a web page or to use authentication or a proxy server).
- HTTP Transaction: Monitors a web server using a set of URLs to monitor whether logins or shopping carts are working fine. You must supply a series of URLs (GET and/or POST requests) including the parameters to monitor a transaction. Use the Paessler URL Recorder to build such a URL list (see below).
- HTTP Content: Monitors a return value provided by a HTTP request. This sensor requests a HTTP URL and parses the result for a value enclosed in brackets "[value]". The most common use is to monitor a particular value inside a web server for validity. For example if you have a script or CGI running on the web server that merely publishes the free disk space of the server's hard disk or the current processor usage you can actually monitor this value. Of course many other usage concepts are possible.
- HTTP Full Web Page: Monitors the full download time of a webpage including images etc. (uses Internet Explorer to perform a full page download)

All sensors support HTTP and HTTPS.

What it means when the HTTP sensor is up

The UP status of an HTTP sensor means that the web server delivers an HTTP result that is correct according to the HTTP protocol and that the URL is available. This means that the web server software is up and running but you do not know whether the results are correct, e.g. the webpage can contain error messages. So you don't know whether the CGI scripts, etc, are working correctly or whether, for example, the database of the web server is ok. It is recommended to also check the content of a web page by using the HTTP Advanced Sensor, instead of the simple HTTP sensor, for added reliability.

What it means when the HTTP sensor is down

There are numerous reasons for an HTTP sensor to fail. Besides normal connectivity problems, the most common problems are internal server errors (error code 50x) and problems caused by an incorrect URL (error code 404, page not found).

Tools

Paessler URL Recorder: Find out the URLs and the POSTDATA strings that a user sends to a web server while surfing a sequence of URLs - useful when setting up HTTP Transaction sensors
http://www.paessler.com/tools/

7.4 Packet Sniffing Sensor Types

Packet Sniffing should come into consideration if your network device(s) do not support SNMP to measure bandwidth usage or if you need to differentiate the bandwidth usage by network protocol and/or IP addresses.

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Note: Packet Sniffing Sensors support Toplists (Top Talkers, Top Connections, etc.), see Toplists.

How Packet Sniffing works

If you need to know what applications or IP addresses are causing the traffic in your network, you can use a packet sniffer. This will look at every single data packet traveling through your network for accounting purposes.

PRTG can analyze the packets passing the network card of a PC or it can be connected to the so-called monitoring port of a switch. In order to calculate bandwidth usage, PRTG inspects all network data packets either passing the PC's network card (shown on the left side) or the data packets sent by a monitoring port of a switch (right side) with its built-in packet sniffer.

Comparing the four bandwidth monitoring technologies provided by PRTG (SNMP, WMI, NetFlow and Packet Sniffing) this one creates the most CPU and network load and should thus only be used in small to medium networks, on dedicated computers for larger networks or for individual computers.

Reasons To Choose Packet Sniffing

It is important to understand that the packet sniffer can only access and inspect data packets that actually flow through the network interface(s) of the machine running the PRTG software. This is fine if you only want to monitor the traffic of this machine (e.g. your web server). In switched networks, only the traffic for a specific machine is sent to each machine's network card, so PRTG can usually not discern the traffic of the other machines in the network.

If you also want to monitor the traffic of other devices in your network, you must use a switch that offers a "monitoring port" or "port mirroring" configuration (Cisco calls it "SPAN"). In this case the switch sends a copy of all data packets traveling through the switch to the monitoring port. As soon as you connect, the PRTG host machine connected to the port monitored by the packet sniffer is able to analyze the complete traffic that passes through the switch. Another option is to use the PC running PRTG as a gateway for all other computers.

Header Based vs. Content Based Packet Sniffing

PRTG provides two base technologies for packet sniffing:

- Header based: PRTG looks at the IPs and ports of source and destination to assess the protocol. This is very fast but, at times, not very accurate. For example it is not possible to identify HTTP traffic on ports other than

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80, 8080, and 443 as HTTP.
- Content based: PRTG captures the TCP packets, reassembles the data streams and then analyzes the content of the data using an internal set of rules to identify the type of traffic. This is quite accurate (e.g. HTTP traffic on any port number is accounted for as HTTP) but requires much more CPU and memory resources, especially when a lot of traffic passes the network card.

Header based sniffing is much faster but the accounting is less reliable (e.g. HTTP packets on non-standard ports are not accounted as HTTP traffic). Content based sniffing is quite accurate, but creates more CPU load.

Packet sniffing can differentiate between the following protocols:

- WWW Traffic: HTTP, HTTPS
- File Transfer: FTP
- Mail Traffic: IMAP, POP3, SMTP
- Chat, Instant Messaging: IRC, AIM
- Remote Control: RDP, SSH, Telnet, VNC
- Network Services: DHCP, DNS, Ident, ICMP, SNMP
- NetBIOS: NETBIOS
- Various: Socks, OtherUDP, OtherTCP

Packet Sniffing Sensor Types

PRTG offers three sensor types that are based on Packet Sniffing:

- Packet Sniffer (Header): Looks at the headers of the data packets to account traffic by IP, by port, by protocol, etc.
- Packet Sniffer (Content): Reassembles data packets to streams and looks into the payload data of the streams to assess the type of traffic (e.g. SMTP, HTTP, IMAP, file sharing, NETBIOS, etc.)
- Packet Sniffer (Custom): Accounts for data packets using user-specific rules (header based).

In the sensor settings you can choose how detailed you want traffic to be accounted for according to the protocols used. You can also include and exclude filters that allow monitoring of specific packets, IPs, Ports, etc.

Tools

Paessler Card Packet Counter: Shows short term statistics about the network data packets passing a local network card.
http://www.paessler.com/tools/

See also

Bandwidth Monitoring Sensor Type Comparison

Toplists

7.5 NetFlow Sensor Types

NetFlow monitoring is the domain of networks using Cisco switches.

Note: NetFlow sensors support Toplists (Top Talkers, Top Connections, etc.), see Toplists.

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How NetFlow Monitoring works

One option to measure bandwidth usage "by IP address" or "by application" is to use Cisco's NetFlow protocol which is specially suited for high traffic networks. Many Cisco routers and switches support this protocol.

Cisco devices with NetFlow support track the bandwidth usage of the network internally and merely forward pre-aggregated data to the PRTG system for accounting purposes. This way PRTG's computing load is much lower. This option is recommended for high traffic networks.

Reasons To Choose NetFlow Monitoring

NetFlow monitoring is the domain of networks that use Cisco switches. These switches can be configured to send data streams providing the network's usage data to the machine running PRTG which, in turn, analyzes the data.

Because the switch already performs a pre-aggregation of traffic data, the flow of data to PRTG is much smaller than the monitored traffic. This makes NetFlow the ideal option for high traffic networks that need to differentiate the bandwidth usage by network protocol and/or IP addresses.

PRTG Features for NetFlow Monitoring

NetFlow is a bandwidth monitoring technology created by Cisco. PRTG supports flow monitoring using NetFlow Version 5 with the following two sensors:

- NetFlow: Monitors Cisco switches using NETFLOW V5.
- NetFlow (Custom): User configurable version of the NetFlow sensor.

Before you can create NetFlow sensors, you must configure NetFlow on your switch/router. Configure the switch to send the NetFlow packets to the computer running the PRTG probe. Also, configure the NetFlow port and flow timeout. These two values must be defined within PRTG when creating new NetFlow sensors. Don't forget to open the NetFlow port in the PRTG system's firewall.

Limitations

On a powerful 2007/2008 PC, (Dual Core, 2.5 Ghz) you can process about 100,000 flows per second for one NetFlow stream. When using complex filters, the value can be much lower. For example, with a router sending

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about 2,000 flows/second (which corresponds to mixed traffic at gigabit/sec level) you can expect to configure up to 50 NetFlow sensors operating properly. PRTG internally monitors its own NetFlow processing and you will see a decreased probe health reading as soon as NetFlow packets are not processed due to an overload.

If you experience an overload please consider setting up multiple probes and distribute the NetFlow streams to them. We do not recommend adding more than 400 NetFlow sensors per PRTG probe.

Tools

Paessler NetFlow Generator: Netflow Generator creates artificial NetFlow Version 5 data streams without the need for NetFlow compatible hardware. It is a perfect tool to test the NetFlow functionality of PRTG or other NetFlow compatible programs.
http://www.paessler.com/tools/netflowgenerator

Paessler NetFlow Tester: NetFlow Tester simply dumps the data of all NetFlow packets that a computer receives from a Cisco router - useful when debugging bandwidth monitoring configurations based on NetFlow protocol.
http://www.paessler.com/tools/

See also

- Bandwidth Monitoring Sensor Type Comparison
- Toplists
- Paessler Knowledge Base: Configuration Tips for Cisco Routers and PRTG
  http://www.paessler.com/support/kb/questions/20/

7.6 SQL Server Sensor Types

Using the SQL Server sensors you can natively monitor the most commonly implemented SQL servers: MySQL, Microsoft SQL, and Oracle SQL. The sensors monitor when the database server process accepts and processes requests. Additionally, you can run a custom SQL command and check the return values.

PRTG supports native monitoring for the following SQL Servers:

- Microsoft SQL Server: Checks Microsoft SQL server connections.
- MySQL Server: Checks MySQL server connections.
- Oracle SQL Server: Checks Oracle SQL server connections.

Common Settings for all SQL Sensors

- Database Name – in this field, the name of the database or the path of the database can be entered in order to access the database information.
- User and Password – provide the username and password to login to the database.
- SQL Expression – provide an expression to fetch data. When a cursor is returned, only the first row will be fetched.
- Result Set – select this checkbox if your SQL expression returns a result set. Then the value of the first column in the first row of the result set is used as the return value of the monitoring request (e.g. will be compared to the limits). Otherwise the “number of affected rows” is regarded to be the return value of a monitoring request.

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Notes for MS-SQL Sensors

- Supports SQL Server 2005, SQL Server 2000, SQL Server 7 and MSDE (requires OLE DB installed on the machine running the PRTG probe that accesses the server).
- Instance Name – This holds the name of the instance if you want to connect to a "named instance", otherwise this field should remain empty. **Note:** Sometimes you will see connection strings like SQLSERVER \SQLINSTANCE in database clients. The first part is the server name configured under the general server settings. The second part refers to the instance name mentioned above. **NEVER** enter the string in the instance field of the sensor setup page in this form, merely provide the second part (without the backslash).
- Port – If your SQL server runs the instance at a different static port than 1433, you can define the port number in this field. If your SQL server uses the default value of 1433 or is configured for dynamic port settings, leave this field empty.

Notes for Oracle SQL Sensors

- Supports Oracle 10g, 9i, 8i and Oracle 7 (requires default TCP Port Setting 1521).
- Interface – Oracle offers two possibilities when connecting to the server - either through direct TCP/IP communication (SQL-NET) or via the Oracle Client Interface (OCI). Select the one you want to use for this sensor.
- Port – Under SQL-NET you need to supply the TCP/IP port for the connection in this field. Usually the default value of 1521 is correct. With an OCI connection the setting of the port property is ignored.

Notes for MySQL Sensors

- Supports MySQL server 5.0, 4.1, 4.0 and 3.23.

7.7 File Server Sensor Types

In order to monitor file servers you can use the following sensors.

- WMI Disk Space: This sensor type monitors free disk space via WMI (see WMI Sensors Types)
- WMI File: Monitors a file via WMI (see WMI Sensors Types)
- Share Disk Space: Monitors free disk space of SMB shares (Windows/Samba)
- File: Monitors a file's existence, size, and age and also discovers changes to the file
- Folder: Monitors a folder's existence as well as the number of files and their ages/sizes and also discovers changes to the folder's content

7.8 Mail Server Sensor Types

Using a number of sensors for mail servers you can ensure that your mail systems are working.

Standard Email Protocols

- SMTP: Monitors availability of SMTP based email servers (Simple Mail Transfer Protocol).
- POP3: Monitors availability of POP3 based email servers (Post Office Protocol V3).
- IMAP: Monitors availability of IMAP based email servers (Internet Message Access Protocol).

Email Round Trip Sensors

Email round trip sensors ensure the end-to-end delivery of emails and make it possible to monitor availability

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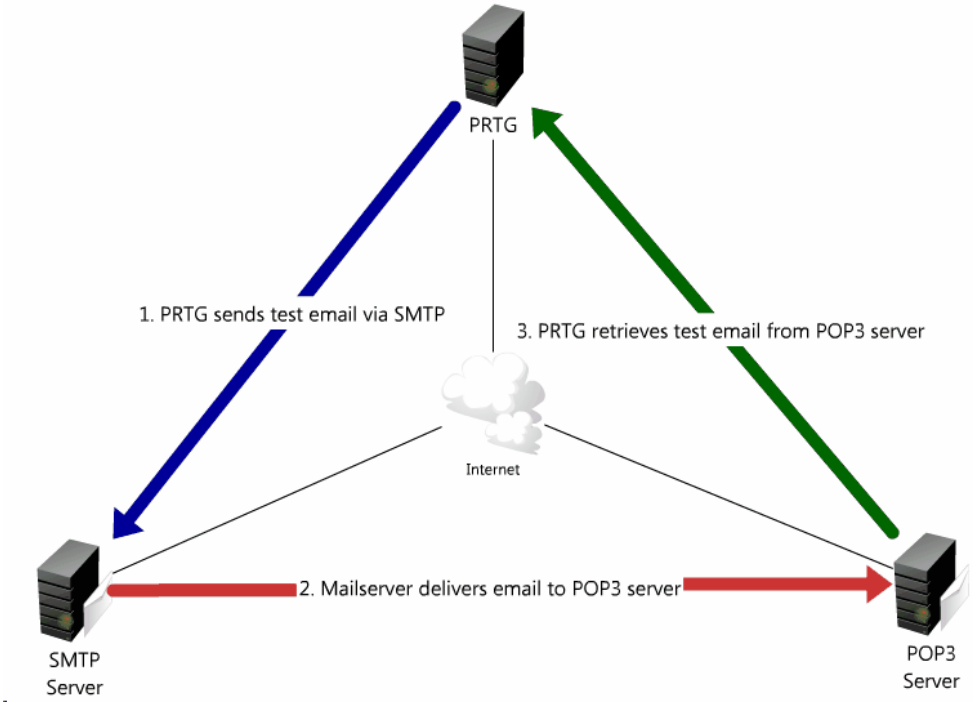
and performance of a complete email delivery process. There are two sensor types for this task:

- SMTP & IMAP Round Trip Sensor
- SMTP & POP3 Round Trip Sensor

Both initially deliver an email to a mail server using SMTP. Afterwards a mailbox is scanned using POP3 or IMAP until the email arrives. The graph shows a sample configuration:

- Step 1: PRTG delivers an email via the SMTP protocol to a mail server (just like an email client).
- Step 2: The SMTP server delivers the email to a POP3/IMAP server (which can be located at a remote site, in your local LAN or on the same server as well).
- Step 3: Every few seconds PRTG retrieves emails from the POP3/IMAP server until the test email arrives.

The test email contains a unique code in the topic which is used to identify the email (e.g. “PRTG7 Roundtrip Mail: {6D136420-5A3E-46CF-871A-1DAF0C4F3D5D}”).


PRTG
1. PRTG sends test email via SMTP
3. PRTG retrieves test email from POP3 server
Internet
2. Mailserver delivers email to POP3 server
SMTP Server
POP3 Server

Recommended Configuration

Here is a simple concept to check delivery of email out of and into your organization:

- Create a dedicated email account for this test in your mail system.
- Set up an external email account (hosted mail server, freemailer, etc.) that delivers all emails back to an email account in your organization.
- Set up PRTG’s round trip sensor to send an email to the external email account using your LAN’s mail server and then check for the mailbox on your mail system for arrival of the email.

With this technique you are testing multiple aspects of your email server setup as long as the sensor shows a green light:

- Your email server accepts emails via SMTP.

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- Emails are being sent to the outside world (internet connection works, MX lookups work, etc.).
- Emails from external mail server can be delivered into your mail system (this includes aspects like the fact that the MX records for your domain are correct, your mail server can be reached from the outside world, your email filtering is working, etc.).
- Emails can be retrieved using POP3 (or IMAP).

Conclusion

These two new sensor types are a great tool to ensure delivery of email from and to your mail servers. Compared to the standard SMTP, POP3 and IMAP sensors - which only check the availability of these services - the two new sensor types actually monitor the complete transaction from accepting the mail on the first email server to delivery of the mail on the final POP3/IMAP server.

7.9 VMware Server Sensor Types

With PRTG you can monitor the vital parameters of VMware host servers and the virtual machines running on them.

Sensor types are:

- VMware ESX Host Server: Monitors a VMware ESX Host Server
- VMware Virtual Machine: Monitors a single Virtual Machine

While the ESX Host Server sensor only works directly with an VMware ESX 3.x server as its parent device you can use the virtual machine sensor in two ways:

- Use it to directly communicate with a VMware ESX 3.x Host Server to monitor virtual machines running on this server.
- Use it to communicate with a VMware Virtual Center installation to monitor all virtual machines managed by this virtual center. Only this option supports virtual machines running on VMware Server 2.x and virtual machines that are under control of VMware's VMotion feature.

For VMware sensors PRTG needs an administrator login for the host server(s). You can enter these credentials in the VMware Credentials section for the parent device or group. The sensors will then inherit these settings.

Notes:

Due to performance limitations we recommend to keep the number of VMware sensors querying the same virtual server and using the same user account below 20. If you have more sensors you should use two or more user accounts or your should distribute the sensors across multiple probes.

VMware is a registered trademark of VMware Inc.

7.10 Internet Protocol Sensor Types

The following sensor types allow to monitor various TCP and UDP based services:

- PING: Performs one or more PINGs to monitor the availability of a device and optionally measure packet loss in percent.
- PORT: Checks the availability of TCP based network services.
- FTP: Monitors the availability of a FTP Server.
- DNS: Checks a DNS (Domain Name Service) server.

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- RDP (Remote Desktop): Checks whether the RDP service of a device is available.

All these sensors use the protocol standards.

The HDD Health sensor can only be used on probe devices and monitors various parameters of physical disk drives.

7.11 Custom Sensor Types

Custom sensors allow a number of monitoring tasks that go far beyond the standard sensor set to be performed. Apart from parameterized versions of SNMP, sniffer and NetFlow sensors you can create your own sensors using WQL (WMI Query Language) and by compiling an EXE file, using any Windows software development tool.

PRTG supports four custom sensor types:

- EXE: Runs a custom program (EXE, DLL) or script/batch file.
- WMI Custom: Performs a custom WMI query written in WQL (WMI Query Language). See WMI Sensors Types
- SNMP Custom: Monitors a specific OID (yu must supply an OID for this sensor). See SNMP Sensors Types
- Packet Sniffer (Custom): Accounts for data packets using user-specific rules, see Packet Sniffing Sensor Types .
- NetFlow (Custom): User configurable version of the NetFlow sensor, see NetFlow Sensor Types.
- Sensor Factory: see Sensor Factory

Custom EXE/DLL/BAT/CMD/VBS/PowerShell and WQL Sensors

You must create the sensor as a file and place it in a specific folder on the system running the PRTG probe (i.e. if you are using remote probes the files must be copied to the remote system!):

- Place executables (.EXE, .DLL), batchfiles (.CMD, .BAT), VBS scripts (.VBS), or PowerShell scripts (.PS1) into the "PRTG Network Monitor\custom sensors\EXE" subfolder.
- Place .WQL files with WQL scripts into the "PRTG Network Monitor\custom sensors\WMI WQL scripts" subfolder.

You will find a sample set of demo sensors in these folders, too. As soon as a file is placed into the folders mentioned above, you can create or edit a Custom EXE sensor or WMI Custom sensor and select the new file from the list of files.

The probe will then execute the file on the probe system. The local probe will be run the file on the local PRTG Core Server system. But for remote probes, the file will actually run on the remote system. If your custom sensor code relies on other files (eg. DLLs, .NET framework, Windows PowerShell, etc.) you must copy/install these files onto the probe machine manually.

See Interface Definition for Custom EXE Sensors for detailed documentation.

In the parameter fields you can use these placeholders:

- %host: device IP/DNS
- %device: device name
- %probe: probe name
- %name: sensor name

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Notes

- For PowerShell scripts, make sure that they may be executed by either signing the files or changing the security policy for Powershell.exe accordingly.
- The API interface for custom EXE sensors is compatible to the custom EXE sensors provided by IPCheck Server Monitor 5.

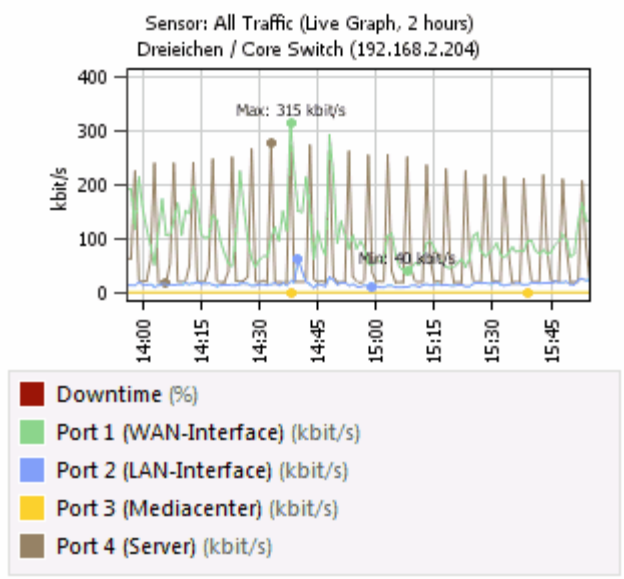
7.12 Sensor Factory

A sensor with special capabilities is called the "Sensor Factory". It allows to combine measurements from two or more sensors into one new sensor.

Samples for the usage are:

- Show two ore more channels from one or more sensors in one graph
- Add the value from two or more channels from one or more sensors into a new value (you can also subtract, multiply and divide values)
- Create charts with one or more graph lines and one or more horizontal lines at specific vertical positions

This is the graph of a sensor factory with 4 channels that use data from 4 different sensors:



Here is second sample: A sensor factory which compares the results of an SNMP sensor, a WMI sensor and two packet sniffer sensors for one data line. And there is a horizontal line at 2 Mbit/s.

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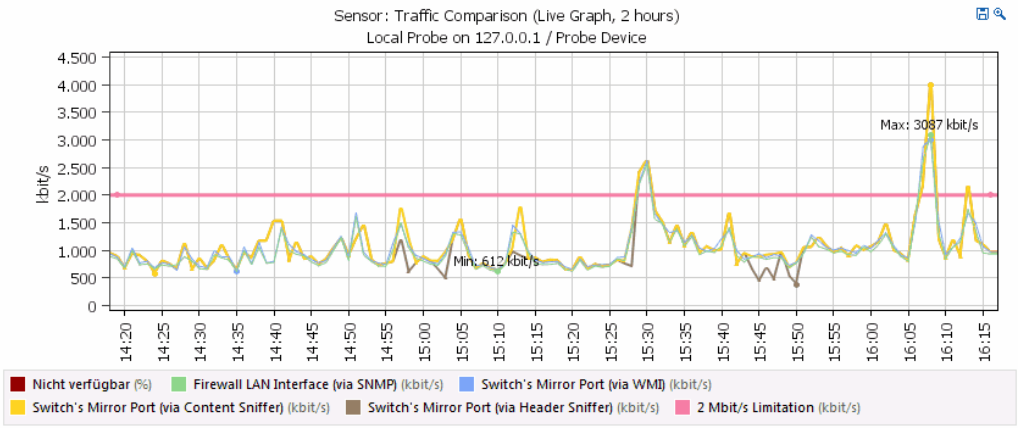
Sensor: Traffic Comparison (Live Graph, 2 hours)
Local Probe on 127.0.0.1 / Probe Device
kbit/s
Max: 3087 kbit/s
Min: 612 kbit/s
Nicht verfügbar (%)
Firewall LAN Interface (via SNMP) (kbit/s)
Switch's Mirror Port (via WMI) (kbit/s)
Switch's Mirror Port (via Content Sniffer) (kbit/s)
Switch's Mirror Port (via Header Sniffer) (kbit/s)
2 Mbit/s Limitation (kbit/s)

The Sensor Factory can be found in the "Custom Sensors" section when creating a new sensor.

Channel Definition Basic Syntax

The behaviour of a sensor factory sensor is controlled by a text field called "Channel Definition". The basic syntax for a channel definition looks like this:

```
#<id>:<name>[<unit>]
<formula>
```

For each channel one section - which begins with the # sign - is used. Here is an example with two channels:

```
#1:Sample
Channel(1000,0)
#2:Response Time[ms]
Channel(1001,1)
```

The parameters are:

- The <id> must be a unique number (1 or greater).
- The <name> is the name of the channel (displayed in graphs and tables).
- The [<unit>] is optional (e.g. bytes). If it is not provided a fitting unit string is automatically selected (recommended).
- The <formula> contains the formula to calculate the channel.

In the formula the following elements are allowed:

- Basic operations: + - * / -, Example: 3 + 5 * 2
- Brackets: ( ) - Example: 3 * (2 + 6)
- Compare: = (equal) <> (not equal) > (greater) < (less) >= (greater or equal) <= (less or equal), if the compare is true the value is 1, otherwise 0, for delta sensors the speed is compared
- Functions: channel,min,max,avg,percent

channel() Function

The channel() function allows to read the data from a channel of a different sensor. The syntax is:

```
channel(<SensorId>,<ChannelId>)
```

- The SensorId is displayed behind the sensor name on the sensor "Overview" page.
- The ChannelID displayed doe each channel in the "Edit Channel" section of the "Channels" page.

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Example: Read the data of channel 2 of sensor 2001

```
channel(2001,2)
```

Channels can be gauge values (e.g. ping ms) or delta values (e.g. traffic kbit/s) values. Not all combinations are allowed in a formula. You can NOT:

- Add/subtract a delta from a gauge channel (and vice versa)
- Multiply two delta channel
- Compare a delta with a gauge channel
- Use a channel of a Aggregation channel in the formula

min() and max() Functions

The min() and max() functions return the minimum or maximum of the two values. The syntax is:

```
min(<a>,<b>)
max(<a>,<b>)
```

Values for a and b are numbers or channel() functions, see this example:

```
min(10,5) -> return 5
min(channel(2001,1),channel(2002,1)
```

The latter one returns the minimum of channel 1 of the sensors 2001 and 2002.

avg() Function

avg() returns the average of the two values. This equals: (a+b) / 2. The syntax is:

```
avg(<a>,<b>)
```

Example:

```
avg(20,10) -> returns 15
```

percent() function

Calculates the percent value of a value (e.g. a channel) compares to a fixed value. The syntax is:

```
percent(<source>,<maximum>,<unit>)
```

Source is the value the percent is calculated for. This is usually a channel() function. Maximum is the limit value used for the percent calculation. Unit is optional and is the unit the maximum is provided in. This value is multiplied with the maximum value. You can use constants here (see below for a list). This can be used for gauge (e.g. Ping) sensors und delta (e.g. Traffic Sensors).

The following example shows how to display a traffic sensor as % of maximum bandwidth (100 kilobit/second)::

```
#1:Usage IN
percent(channel(2001,0),100,kilobit)
#2:Usage OUT
percent(channel(2001,1),100,kilobit)
```

Another example shows how to display the values of a sensor as percentage of 200ms:

```
#1:Ping %
percent(channel(2002,0),200)
```

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Horizontal Lines

You can add lines to the graph using a formula without a channel() function (returning a fixed value). In this case you have to provide the unit of the axis the line is used for. You can use constants here. Examples:

```
#1:Line at 100ms[ms]
100
#2:Line at 50 kbit[kbit/s]
50
#3:2 Mbit/s [kbit/s]
2000
```

Constants

The following constants are defined and can be used in calculations:

- one = 1
- kilo = 1000
- mega = 1000 * kilo
- giga = 1000 * mega
- tera = 1000 * giga
- byte = 1
- kilobyte = 1024
- megabyte = 1024 * kilobyte
- gigabyte = 1024 * megabyte
- terabyte = 1024 * gigabyte
- bit = 1/8
- kilobit = kilo / 8
- megabit = mega / 8
- gigabit = giga / 8
- terabit = tera / 8

Channel Settings

The color, line thickness, warning/error limits, etc. can be edited on the "Channels" tab after creating the sensor. This works like with any other sensor. You can also use triggers to send notifications.

Tips and Infos

- The data is always calculated on the fly using the historic data of the sensors if available
- The display of live data for sensor factory sensors can be delayed since it has to wait for data in all used channels
- You can use channels from sensors with different scanning intervals to create a new channel, but it is recommended to use the same value for the source sensors and the sensor factory
- There is no uptime/downtime totals calculation for aggregation sensors
- The coverage of the Sensor Factory is defined as the minimum coverage of all Sensor Factory channels.
- The coverage of a Sensor Factory channel is the weighted average coverage of the sensors used in the calculation.
- The downtime channel of Sensor Factory senors is defined as the average of the downtime of all used channels.

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7.13 Comparison of Bandwidth Monitoring Sensor Types

The following table shows the differences between PRTG's four methods available for bandwidth monitoring:

	WMI	**SNMP**	**Packet Sniffing**	**Netflow**
Setup	Medium	Easy	Easy to Complex (depending on filter rules used)	Can be complex (e.g. the switch must be configured)
Traffic can be filtered	No	No	Yes	Yes
Differentiate bandwidth usage by protocol or IPs	No	No	Yes	Yes
PRTG can show Toplists (Top Talker, Top Connections, Top Protocols, etc.) (V7.1)	No	No	Yes	Yes
Filter bandwidth usage by IP	No	No	Yes	Yes
Filter bandwidth usage by MAC address	No	No	Yes	No
Filter bandwidth usage by physical network port	Yes	Yes	No	No
Monitor network parameters other than bandwidth usage	Yes	Yes	No	No
CPU load on the machine running PRTG	Low	Low	Higher, depends on the amount of traffic	Higher, depends on the amount of traffic
Excess bandwidth usage of monitoring	Small	Small	None (except when monitoring switch ports are used)	Depends on the traffic

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Part VIII

Notifications

8 Notifications

“Notifications” are used to send alerts to the user whenever PRTG discovers a defined state, such as slow or failing sensors, or when thresholds are reached. You can define an unlimited number of notifications allowing to use one, or more, of several communication channels like email, pager, SMS messaging, Instant Messenger notification, execute program (EXE file/batch file) or HTTP request, Network Broadcast (NET SEND), play a soundfile and Windows event log entries.

Notifications can be triggered by:

- Sensor status changes (a sensor goes down or up, responses are slow or the sensors show an unusual status).
- When the measured value reaches a specific threshold, (e.g. higher than 1000ms request time for more than 30 minutes).
- Reaching a specific speed threshold (e.g. more than 1Mbit/s for more than 5 minutes. Ttraffic sensors only).
- Reaching a specific data volume threshold (e.g. more than 1 Gbyte transferred in 24-hours. Traffic sensors only).

Notifications can be sent by:

- Email: PRTG provides a built-in mail server (uses MX records to deliver emails) or can use an available SMTP relay.
- SMS or pager message (through third party services).
- Network Broadcast (Note: NetSend is no longer supported on computers running Windows Vista or Windows Server 2008).
- Instant Messenger (ICQ, MSN, Yahoo, AIM).
- HTTP request.
- SNMP Trap.
- Syslog message.
- running an external program or batch file.
- play a sound via external speakers of the system running the PRTG core (sound card required).
- writing an entry into the local system log.

Notifications contain valuable sensor information, such as:

- last error message.
- last good/failed request.
- total downtime.
- total uptime.
- recent sensor history.
- and: email texts, SMS messages, etc. (can be fully edited by the user using placeholders).

Check Notification Setup Before Sending Notifications!

Some notification types require additional setup by the administrator user. Please see System Setup - Notifications.

Creating Notifications

To create and edit notifications choose "Setup|Notifications" from the main menu. Click a name to edit a notification or click on "add notification" to create a new one:

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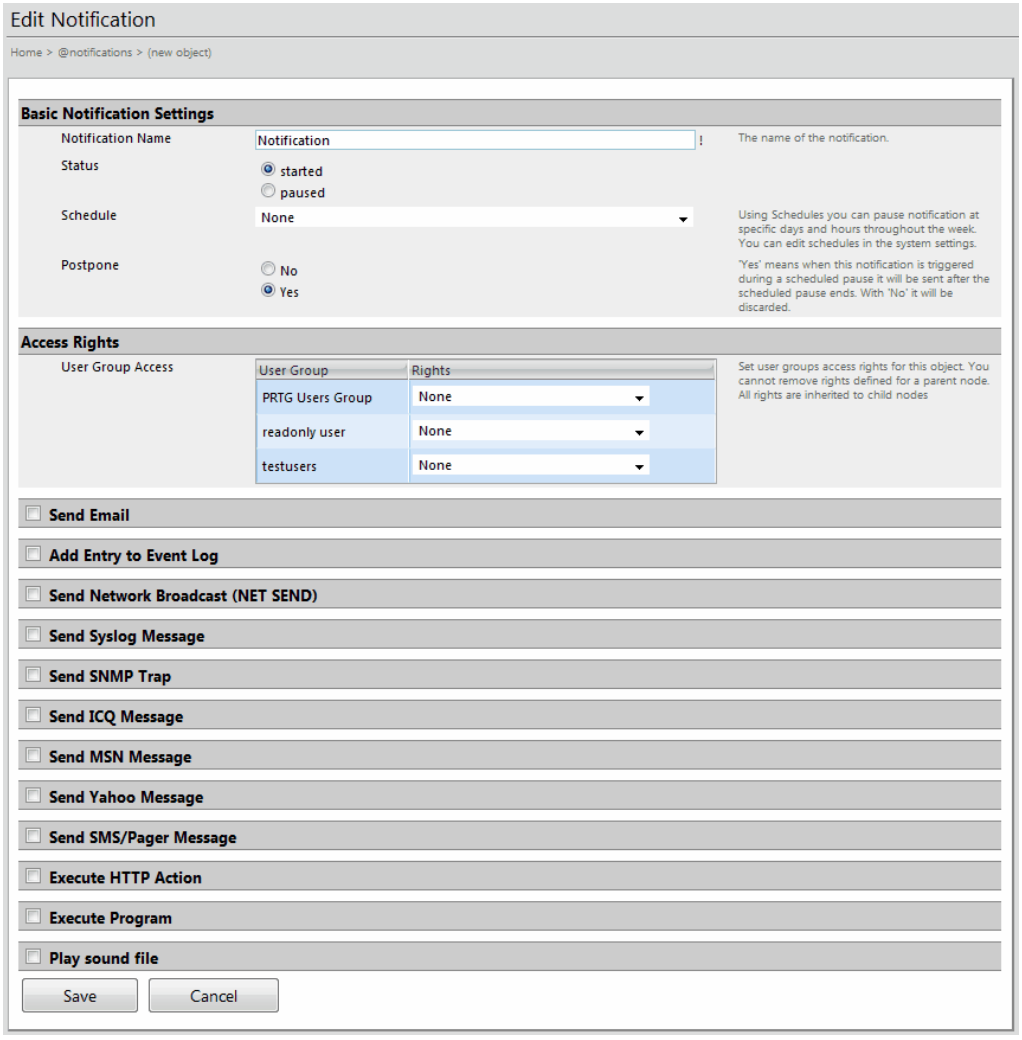

You can enable one or more communication types by checking the respective checkboxes. Then, fill out the specific settings for each type.

Connecting Sensors and Notifications By Creating Triggers

A notification is sent by a trigger. PRTG supports 4 different trigger types:

- State Triggers: Trigger a notification when a sensor enters an UP, DOWN or UNUSUAL state.
- Speed Triggers: Trigger a notifications when a traffic sensor reaches a certain bandwidth limit for a specified time.
- Volume Triggers: Trigger a notification when a traffic sensor has reached a certain volume limit in a specified time.
- Threshold Triggers: Trigger out notifications when certain values are measured by a sensor.

It is recommended to define triggers for notifications on a group or device level. Sensors will then inherit these settings (see Inheritance of Settings). The advantage is that you can change notifications for multiple sensors by merely editing the notification settings on the group level.

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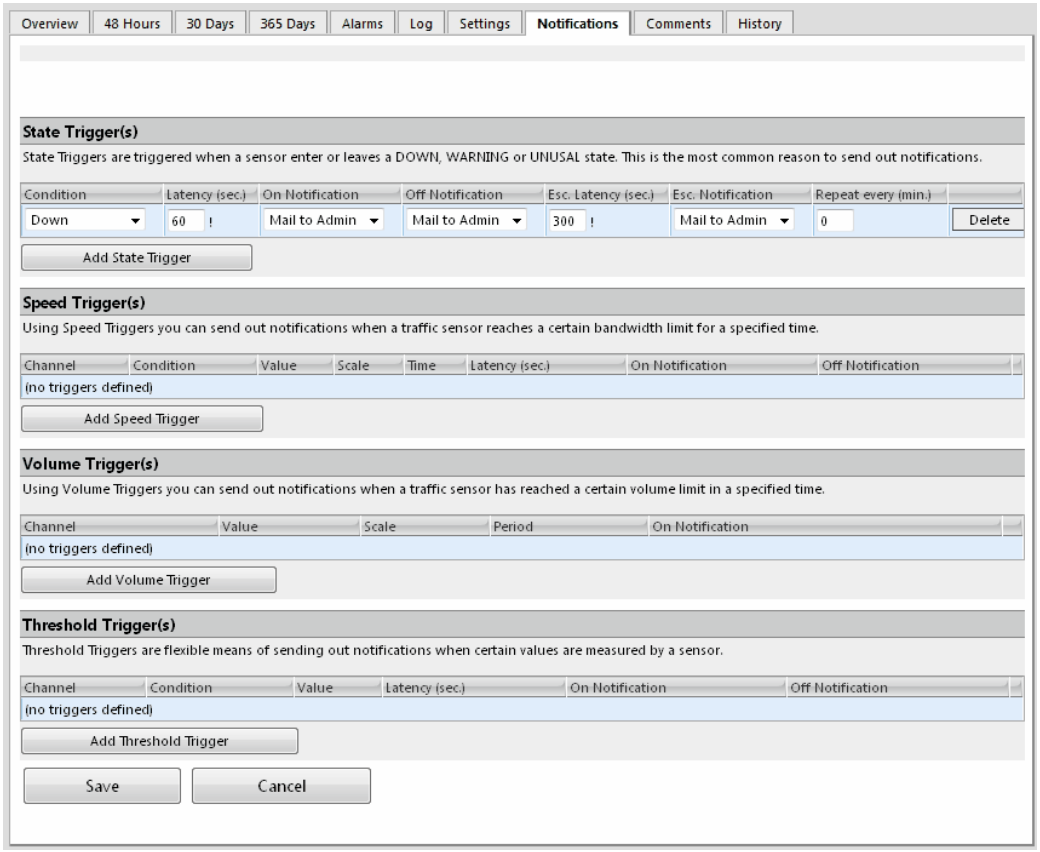
Editing of the notification settings takes place under the "notifications" tabs of groups, devices and sensors:



You can add as many triggers of each type as desired (e.g. one trigger for "DOWN" events and another one for "UNUSUAL" events). Click on Add Trigger, fill out the edit fields and click on Save.

When editing triggers you will see the following settings:

- Latency: Latency is used to defer a notification for a specified time, e.g. to give a server or service the chance to recover from failure or to avoid being spammed with notifications just because a data line was offline for three seconds. For example, if you set the latency for a trigger to 60 seconds, the notification will also be sent if the failure situation remains active for 61 seconds.
- On Notification: This notification will be sent when the trigger becomes active (e.g. a sensor goes down for a state trigger with condition "down").
- Off Notification: This notification will be sent when the trigger becomes inactive (e.g. a sensor goes up for a state trigger with condition "down").

Escalation Notifications

If an error situation remains unsolved for some time, it is a good idea to send additional notifications (e.g. with a more aggressive recipient list) called Escalation Notifications. You can set the latency time to control when escalations are sent and you can also choose to repeat escalation mails every X minutes.

- Escalation Latency: This is the latency time after which escalation notifications will be sent.
- Escalation Notification: The notification that will be sent.
- Repeat every (min): If this value is unequal to zero the notification will be re-sent at the specified interval.

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More

- Account Settings - Notifications
- System Setup - Notifications

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Part IX

Maps

9 Maps

PRTG's "maps" feature is a unique concept that enables the user to create web pages with up-to-the-minute monitoring status information in a customizable layout. There are countless possibilities for the implementation of maps. For example this feature can be used to:

- Create network maps with an overlay of status icons for each device on the map.
- Create "dashboard" views that can be shown on network operations center screens.
- Create a quick network overview for publishing on the Intranet, allowing at-a-glance information for management of other employees.
- Create a custom view of the most important sensors in your monitoring setup.
- Create Top 10 lists of the sensors of a specific group or device.

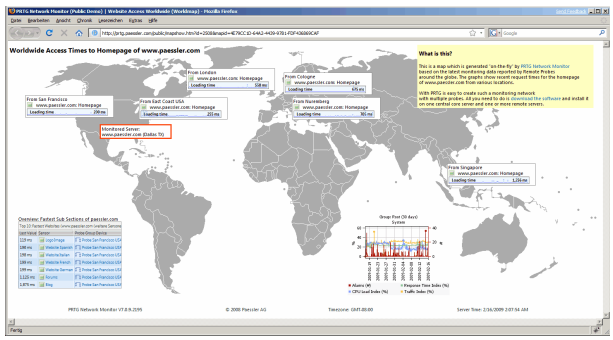
Technically a map is a normal web page and consists of the following:

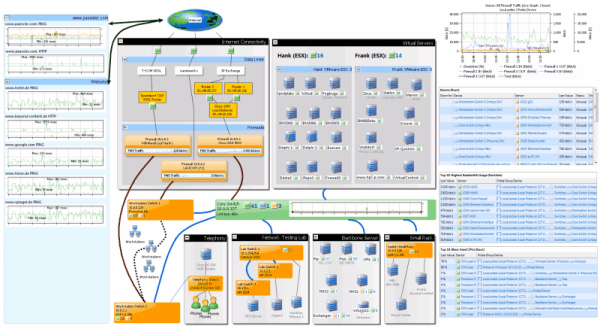
- an optional background image (a PNG/GIF/JPG file, e.g. your company logo, a graphical view of your network).
- a set of map items, which can include sensor status icons, graphs or lists of sensors.

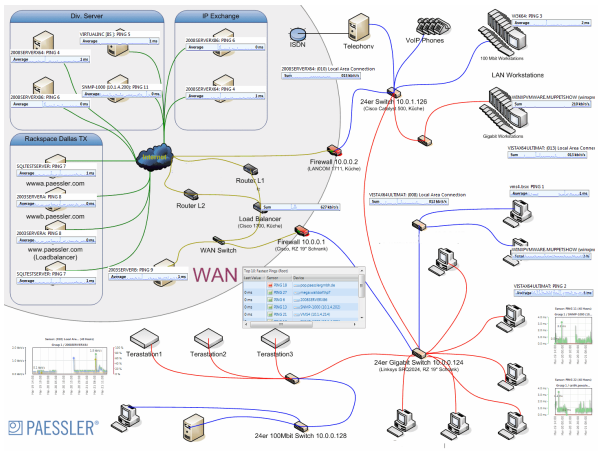
You can also specify the size of the map. Using the AJAX-based map editor, you can place the items anywhere on the map and you can also control the size of the items. Each map has a unique URL which can be used to link to the map. Users who want to access the map either need an account under your PRTG installation, or can access a "public URL" of the map if you enable the "Public Map" feature. Public maps contain a unique access key ("Map ID") in the URL that secure the map from unwanted visitors.

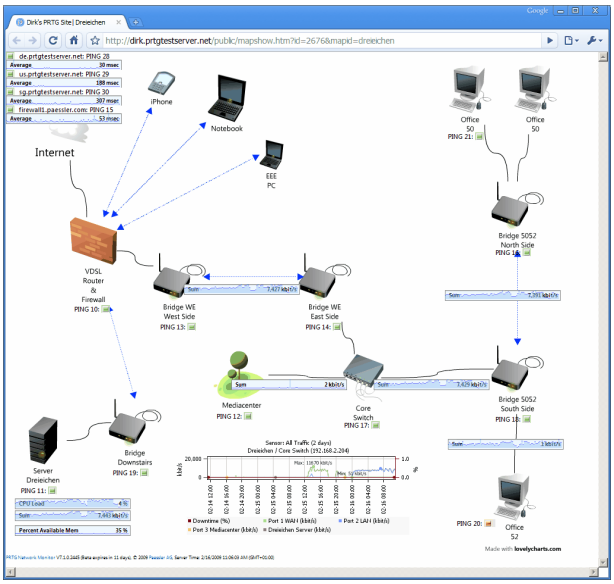
Sample maps

Here are a few sample maps which include live monitoring data:



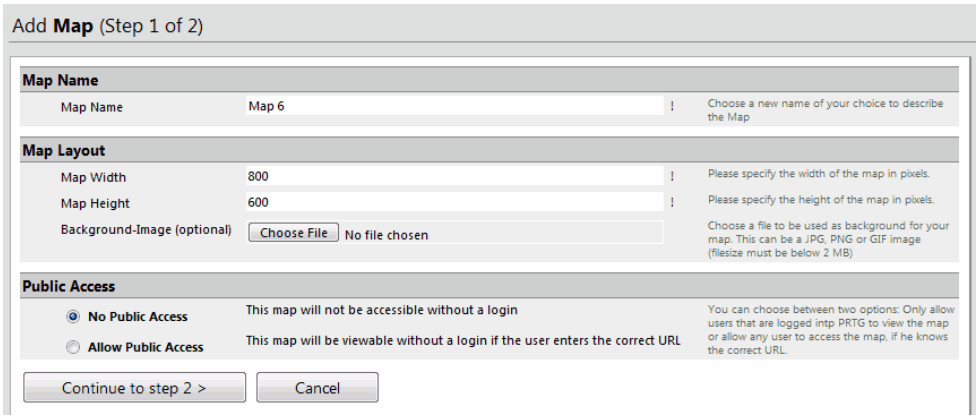






Step 1: Create a New Map

To get started select "Maps|Add New Map" from the main menu:


Add Map (Step 1 of 2)
Map Name
Map Name
Map 6
Choose a new name of your choice to describe the Map
Map Layout
Map Width
800
Please specify the width of the map in pixels.
Map Height
600
Please specify the height of the map in pixels.
Background-Image (optional)
Choose File
No file chosen
Choose a file to be used as background for your map. This can be a JPG, PNG or GIF image (filesize must be below 2 MB)
Public Access
No Public Access
This map will not be accessible without a login
Allow Public Access
This map will be viewable without a login if the user enters the correct URL
You can choose between two options: Only allow users that are logged intp PRTG to view the map or allow any user to access the map, if he knows the correct URL.
Continue to step 2 >
Cancel

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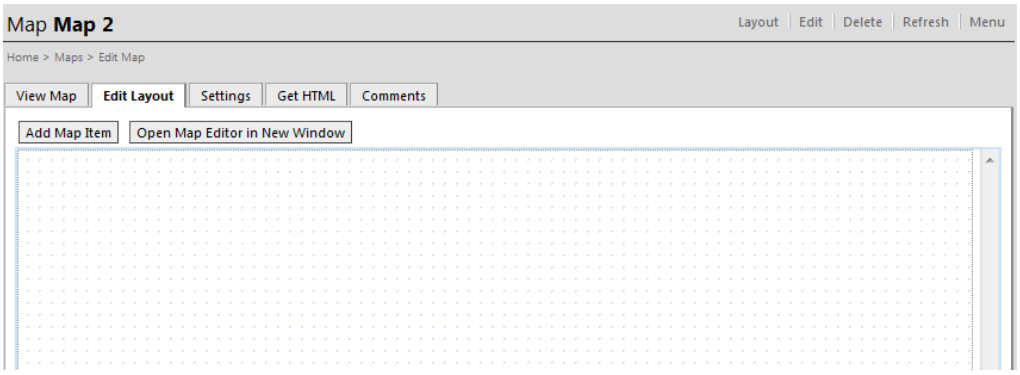
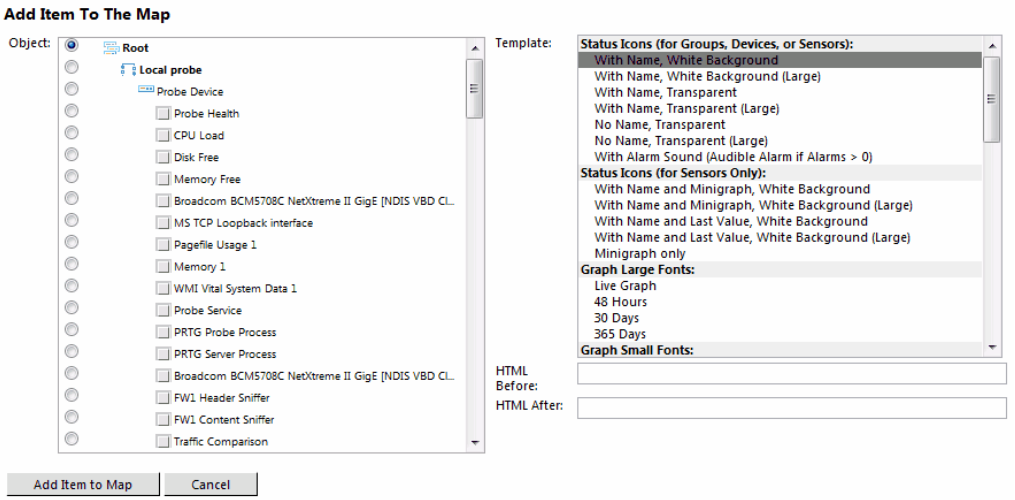
Fill out the fields and optionally select a map background image. Enable "Allow Public Access" if you want users without a PRTG user account to be able to view the map. Click "Continue to Step 2" and you will be taken to the new map.

Step 2: Add Items to the Map

Click on "Edit Layout" to enable the Map Editor:



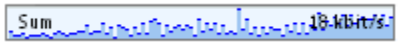
To add an item to the map click on "Add Map Item":



Choose a group, device or sensor from the sensor tree and select a map item template from the lower list. You can optionally add your own HTML code before and after the map element, too.

There are over 40 map item templates available, the basic types are

- Status Icons:

- Minigraph (for sensors only):
  

- Graphs:

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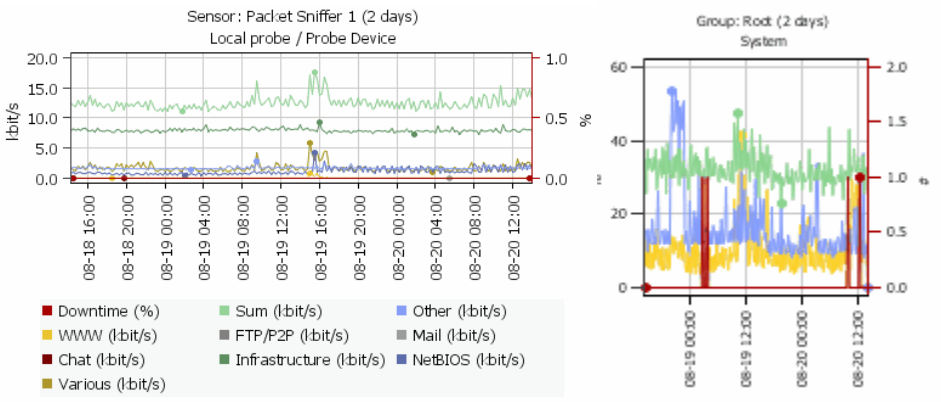
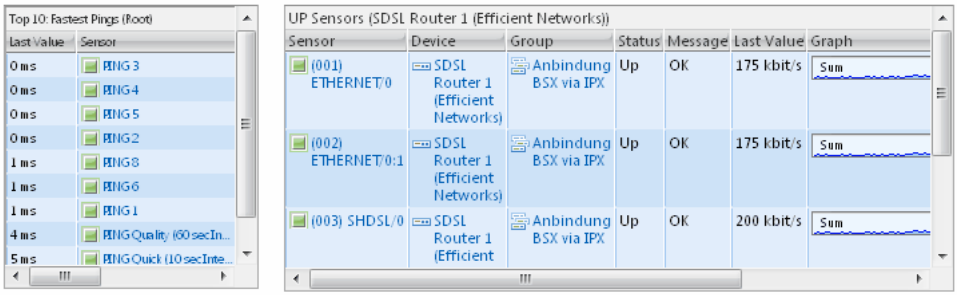
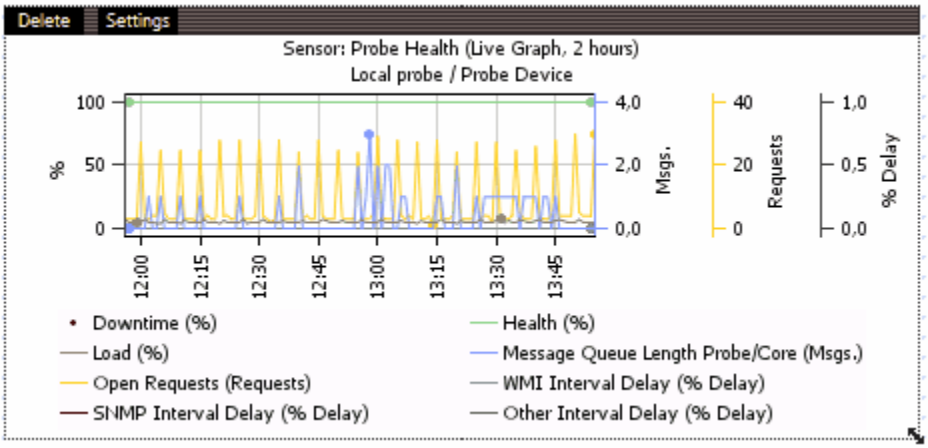


- Tables:



Step 3: Move and Edit Map Items

As soon as you have added an item to the map you can modify it as follows:



- Move the item by clicking and dragging the black "grip bar" at the top.
- Resize the item by dragging the small arrow at the bottom right corner.
- Delete the item by clicking the "Delete" link.
- Edit item settings by clicking the "Settings" link: You can then change the associated monitoring item, template, the HTML as well as the position and size.

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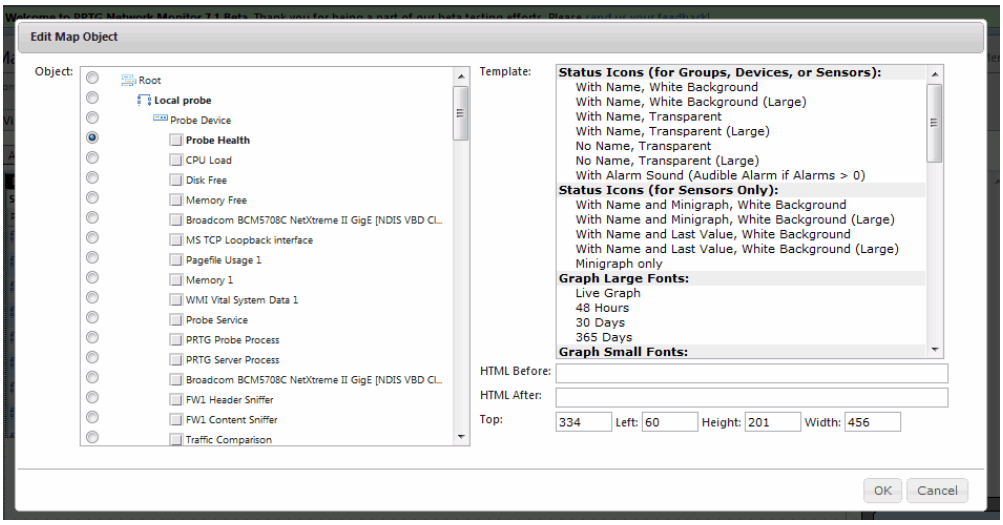

Step 4: View a Map and Share a Map

Click on "View Map" to look at the final layout.

To use the map outside of PRTG you have to two options:

- Option 1: Link to a web page with the map.
- Option 2: Show a map inside other webpages using an IFRAME.

Please click on "Get HTML" in order to discern the necessary URLs and HTML codes as well as additional instructions.

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Part X

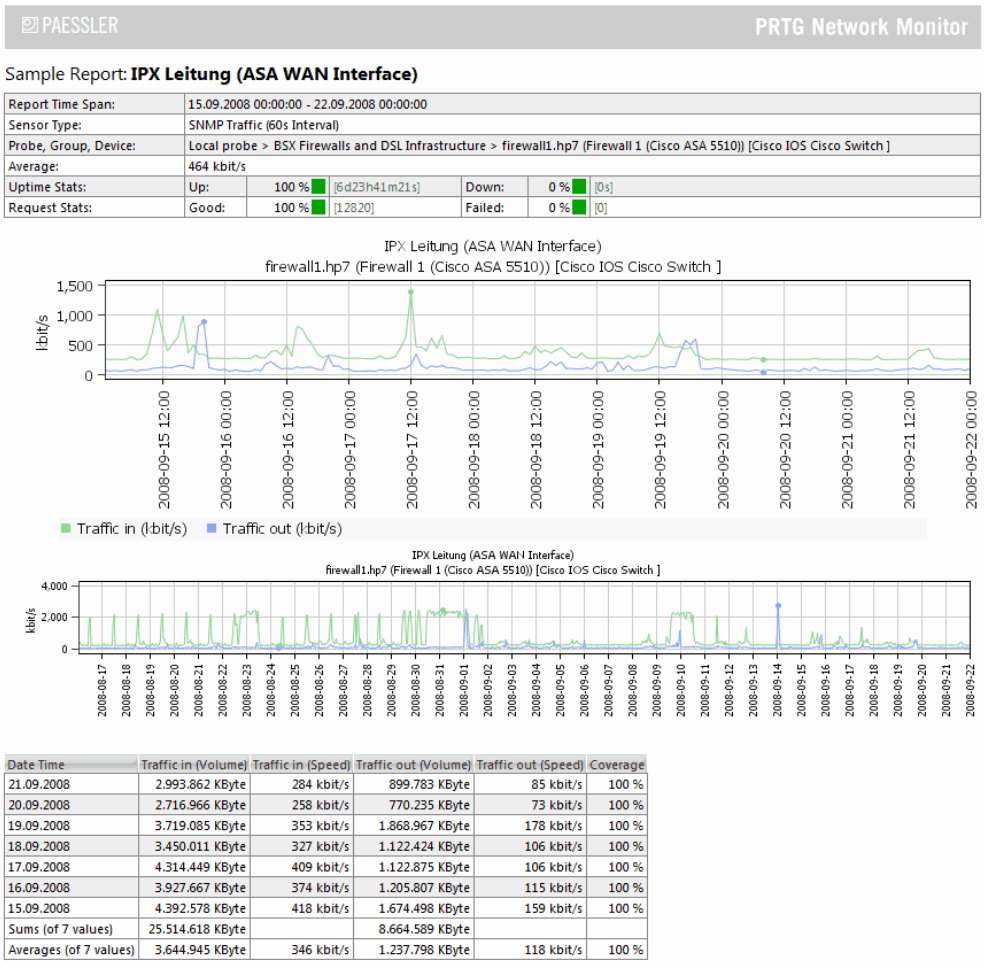
Reports

10 Reports

Reports are used to analyze historic monitoring results over a specified time such as one or more days, one month or one year.

PRTG includes a powerful reporting engine for ad-hoc, as well as scheduled report generation in PDF format. Reports can be run on-demand or can be scheduled (e.g. once a day). A report can be created for one or more sensors. The content and layout of the report is controlled by the report template of your choice and is the same for all sensors in a report.

Here is a sample report page for one sensor: You can see two graphs (one for the current month and one for the sensors history over the last 365 days) plus a data table with the numerical results:



PAESSLER PRTG Network Monitor

Sample Report: **IPX Leitung (ASA WAN Interface)**

Report Time Span:	15.09.2008 00:00:00 - 22.09.2008 00:00:00				
Sensor Type:	SNMP Traffic (60s Interval)				
Probe, Group, Device:	Local probe > BSX Firewalls and DSL Infrastructure > firewall1.hp7 (Firewall 1 (Cisco ASA 5510)) [Cisco IOS Cisco Switch]				
Average:	464 kbit/s				
Uptime Stats:	Up:	100 % [6d23h41m21s]	Down:	0 % [0s]	
Request Stats:	Good:	100 % [12820]	Failed:	0 % [0]	

Date Time	Traffic in (Volume)	Traffic in (Speed)	Traffic out (Volume)	Traffic out (Speed)	Coverage
21.09.2008	2.993.862 KByte	284 kbit/s	899.783 KByte	85 kbit/s	100 %
20.09.2008	2.716.966 KByte	258 kbit/s	770.235 KByte	73 kbit/s	100 %
19.09.2008	3.719.085 KByte	353 kbit/s	1.868.967 KByte	178 kbit/s	100 %
18.09.2008	3.450.011 KByte	327 kbit/s	1.122.424 KByte	106 kbit/s	100 %
17.09.2008	4.314.449 KByte	409 kbit/s	1.122.875 KByte	106 kbit/s	100 %
16.09.2008	3.927.667 KByte	374 kbit/s	1.205.807 KByte	115 kbit/s	100 %
15.09.2008	4.392.578 KByte	418 kbit/s	1.674.498 KByte	159 kbit/s	100 %
Sums (of 7 values)	25.514.618 KByte		8.664.589 KByte		
Averages (of 7 values)	3.644.945 KByte	346 kbit/s	1.237.798 KByte	118 kbit/s	100 %

Creating reports involves 3 steps:

Step 1: Setting up a Report

Select choose "Reports|Add Report" from the main menu to get started:

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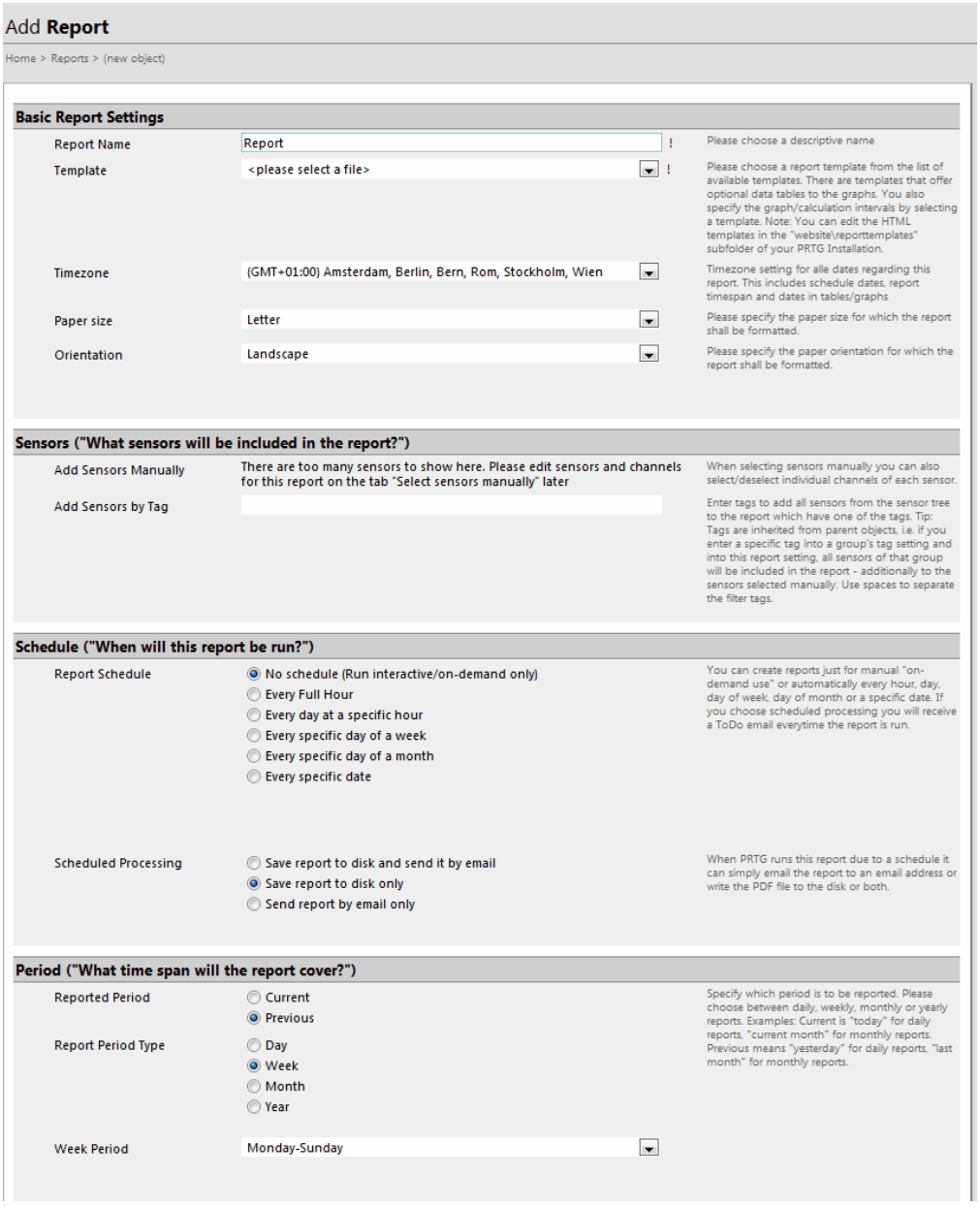
Add Report
Home > Reports > (new object)
Basic Report Settings
Report Name
Report
Please choose a descriptive name
Template
<please select a file>
Please choose a report template from the list of available templates. There are templates that offer optional data tables to the graphs. You also specify the graph/calculation intervals by selecting a template. Note: You can edit the HTML templates in the "website\reporttemplates" subfolder of your PRTG Installation.
Timezone
(GMT+01:00) Amsterdam, Berlin, Bern, Rom, Stockholm, Wien
Timezone setting for alle dates regarding this report. This includes schedule dates, report timespan and dates in tables/graphs
Paper size
Letter
Please specify the paper size for which the report shall be formatted.
Orientation
Landscape
Please specify the paper orientation for which the report shall be formatted.
Sensors ("What sensors will be included in the report?")
Add Sensors Manually
There are too many sensors to show here. Please edit sensors and channels for this report on the tab "Select sensors manually" later
When selecting sensors manually you can also select/deselect individual channels of each sensor.
Add Sensors by Tag
Enter tags to add all sensors from the sensor tree to the report which have one of the tags. Tip: Tags are inherited from parent objects, i.e. if you enter a specific tag into a group's tag setting and into this report setting, all sensors of that group will be included in the report - additionally to the sensors selected manually. Use spaces to separate the filter tags.
Schedule ("When will this report be run?")
Report Schedule
No schedule (Run interactive/on-demand only)
Every Full Hour
Every day at a specific hour
Every specific day of a week
Every specific day of a month
Every specific date
You can create reports just for manual "on-demand use" or automatically every hour, day, day of week, day of month or a specific date. If you choose scheduled processing you will receive a ToDo email everytime the report is run.
Scheduled Processing
Save report to disk and send it by email
Save report to disk only
Send report by email only
When PRTG runs this report due to a schedule it can simply email the report to an email address or write the PDF file to the disk or both.
Period ("What time span will the report cover?")
Reported Period
Current
Previous
Report Period Type
Day
Week
Month
Year
Specify which period is to be reported. Please choose between daily, weekly, monthly or yearly reports. Examples: Current is "today" for daily reports, "current month" for monthly reports. Previous means "yesterday" for daily reports, "last month" for monthly reports.
Week Period
Monday-Sunday

Click on "Save" when your are done with the settings.

Step 2: Editing the List of Objects and Channels

On the next page you can edit the list of groups, devices, sensors and channels which are included in the report:

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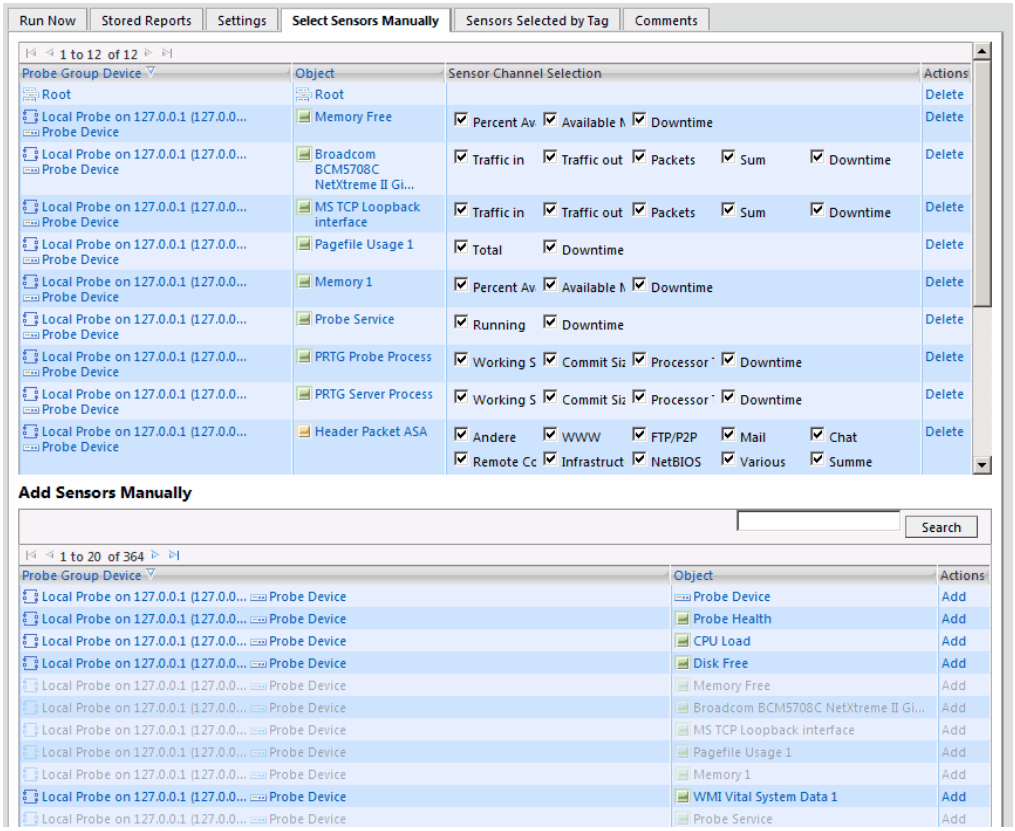
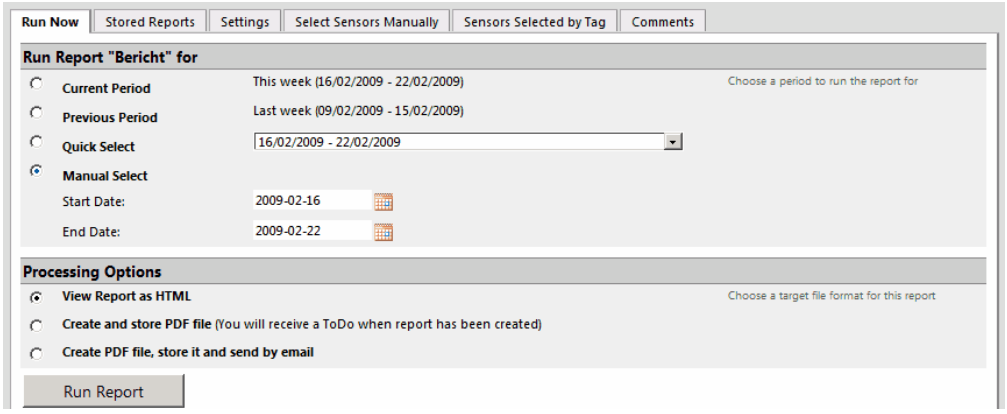


You can enable/disable individual channels of a sensor using the checkboxes. Use the "Delete" links to remove an object from the report. To add more objects to a report choose one from the list of all sensors in the lower half and click the "Add" link. To find a specific sensor either use the paging function of the table or enter a search term in the search box and click "Search".

Step 3: Run the Report Interactively (or wait for the Schedule)

Click on the "Run Now" tab to run the report now:



Select the desired settings and click on "Run Report".

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- HTML Reports will be shown immediately.
- PDF reports will be created in the background and you will receive an email with a ToDo when the report is finished.

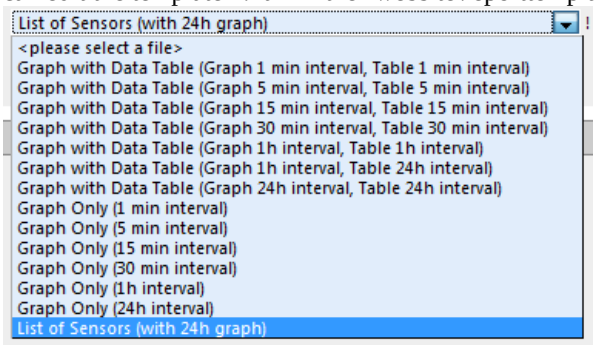
Step 4: Accessing Historic Reports

On the "Stored Reports" tab you can access older reports that are stored on the disk.

Editing Report Settings

To configure a report you must edit the following main settings:

- Name: Please choose a descriptive name.
- Template: You can choose from the list of available templates. There are templates that offer optional data tables besides the graphs. You also specify the graph/calculation intervals by selecting a template. Note: You can edit the template *.htm in the "website\reporttemplates" subfolder of your PRTG Installation.


List of Sensors (with 24h graph)
<please select a file>
Graph with Data Table (Graph 1 min interval, Table 1 min interval)
Graph with Data Table (Graph 5 min interval, Table 5 min interval)
Graph with Data Table (Graph 15 min interval, Table 15 min interval)
Graph with Data Table (Graph 30 min interval, Table 30 min interval)
Graph with Data Table (Graph 1h interval, Table 1h interval)
Graph with Data Table (Graph 1h interval, Table 24h interval)
Graph with Data Table (Graph 24h interval, Table 24h interval)
Graph Only (1 min interval)
Graph Only (5 min interval)
Graph Only (15 min interval)
Graph Only (30 min interval)
Graph Only (1h interval)
Graph Only (24h interval)
List of Sensors (with 24h graph)

- Report Type: Please choose between daily, weekly, monthly or yearly reports. Choose "Current" period for reports that are intended to include the present moment (i.e. a monthly report run on the 20th of the month covers the period from the 1st to 20th of the current month) or "previous" period (i.e. a monthly reports always cover the full previous month).
- Sensors: Select the sensors for the report (note: If you have more than 500 sensors you can not add sensors while creating the report, you must add them later).
- Schedule: You can create reports for manual "on-demand use" or for automatic generation every hour, day, day of week, day of month or a specific date.
- Processing: PRTG can email the report to an email address, save the PDF file to disk or both.

If you choose automatic processing you will receive a ToDo email every time the report is run.

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Part XI

Todos

11 Todos

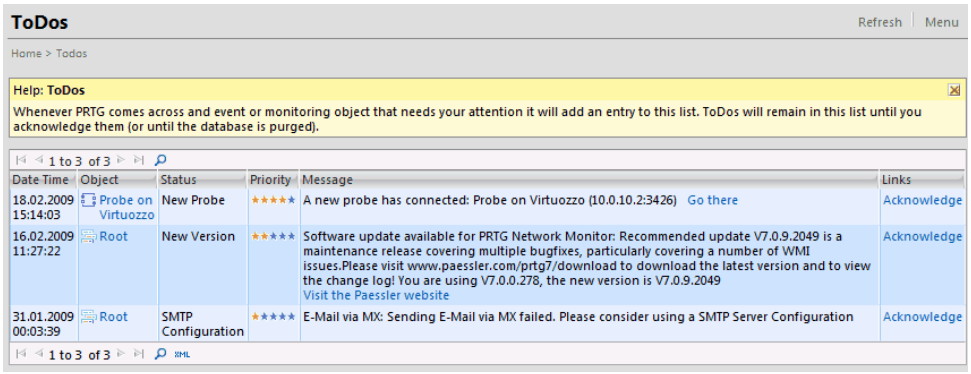
ToDos ("To Dos") are PRTG's way to hand over tasks to you as the administrator, when an event occurs that PRTG can not handle without attention.

You will see a new ToDo whenever any of the following situations arise:

- The auto discovery has discovered a new device and has created new sensors and you should acknowledge them.
- A probe which was not connected before has connected and this new probe must be acknowledged by the administrator.
- PRTG's built-in check for new versions has found that a a new version of the software is available from Paessler.
- A PDF report has been created and is now ready for review.
- A critical situation has shown up on the server system (e.g. system runs out of disk space, licensing issues, etc.).

Whenever a new ToDo is created by PRTG, the administrator user will receive an email asking to take care of the issue (you can disable this automatic email in the system settings). ToDos remain in the list until they are acknowledged (by clicking on "acknowledge").

Click on "ToDos" in the main menu to see a list of all ToDos:


ToDos
Refresh
Menu
Home > Todos
Help: ToDos
Whenever PRTG comes across and event or monitoring object that needs your attention it will add an entry to this list. ToDos will remain in this list until you acknowledge them (or until the database is purged).
1 to 3 of 3
Date Time
Object
Status
Priority
Message
Links
18.02.2009 15:14:03
Probe on Virtuozzo
New Probe
A new probe has connected: Probe on Virtuozzo (10.0.10.2:3426) Go there
Acknowledge
16.02.2009 11:27:22
Root
New Version
Software update available for PRTG Network Monitor: Recommended update V7.0.9.2049 is a maintenance release covering multiple bugfixes, particularly covering a number of WMI issues.Please visit www.paessler.com/prtg7/download to download the latest version and to view the change log! You are using V7.0.0.278, the new version is V7.0.9.2049
Visit the Paessler website
Acknowledge
31.01.2009 00:03:39
Root
SMTP Configuration
E-Mail via MX: Sending E-Mail via MX failed. Please consider using a SMTP Server Configuration
Acknowledge
1 to 3 of 3

Note: You can acknowledge all ToDos at once by choosing the corresponding item from the ToDo menu.

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Part XII

User Management

12 User Management

The default administrator can use the PRTG installation as the only user or can create an unlimited number of users. Users are organized using an unlimited number of groups (which also control their security settings).

There are three types of users:

- Administrator users: Only members of the "PRTG Administrator" groups can create and edit user accounts and they can see and edit all monitoring objects.
- Read/Write users: These users can see all menus and links needed to edit the monitoring configuration (regardless of whether they are allowed to change it)
- Read Only users: These users will not see any editing links or menus and thus will not be able to edit the configuration

All the security settings as well as the rights management are conducted via the user groups. This means that group membership controls what a user may do and which objects he sees when logged in.

Creating New Users

For each new user the administrator user must specify a login name and an email address. New users can be created by selecting "Setup|Users" from the main menu and clicking on "Add new user".

Tip: If you want to control the rights of each user individually, you must create a user group for each user. This can be automated by choosing "Create new user group for this user" from the "Primary Group" drop-down when creating a new user account. This will create a new user and a new user group with the same name. In turn, you can use this user group to control the user's rights individually.

User Account Settings

Each user account has a number of settings that can be changed by the user (choose "Setup|My Account" from the main menu) or by the administrator. These settings are:

- Password: Here you can change your login password.
- Time zone: All times will be shown in this time zone as soon as the user is logged on.
- Auto refresh type and interval: PRTG automatically refreshes the content in your browser. Here you can choose between two different refresh methods, you can disable the refreshing and you can specify the refresh time (30s recommended).
- Audible alarm: Plays an alarm sound for each browser refresh whenever the number of alarms is not zero
- Chart Rendering and Flash Graph Delay: Choose whether you would like graphs based on static images (which load faster) or Flash based graphs (which offer more interactivity, e.g. with hover information for each value).
- Autofolding Settings: In order to provide you with a speedy user experience PRTG tries to keep the page size for the pages with the sensor tree small by automatically "folding" groups and devices with many items. The two settings "Max. Groups/Devices per Group" and "Max. Sensors per Device" control how many groups/devices or how many sensors are shown at max before the automatic reduction is performed. Recommended values are 10-30 for both settings. If you do not want to see any individual sensors in the tree view enter a zero for "Max. Sensors per Device".
- Account Type: Choose between Read/Write User and Read Only User (see above)
- Primary Group: Each user has a primary group which controls his rights.
- Active/inactive: The administrator can set a user to inactive, meaning the user can not log on.

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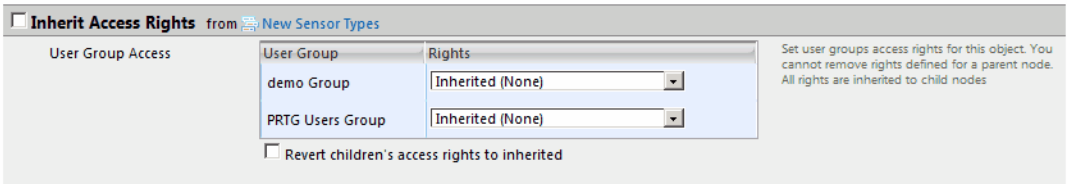
Creating New User Groups

Creating new users is performed by selecting "Setup|User Groups" from the main menu and clicking on "Add new user group".

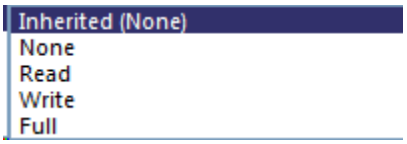
Controlling User Rights

Throughout the web interface of PRTG you can control access to the monitoring objects (e.g. groups, devices, sensors, maps, reports, etc.) using the following settings:


Inherit Access Rights from New Sensor Types
User Group Access
User Group
Rights
demo Group
Inherited (None)
PRTG Users Group
Inherited (None)
Revert children's access rights to inherited
Set user groups access rights for this object. You cannot remove rights defined for a parent node. All rights are inherited to child nodes

For sensor tree objects the default setting is to "Inherit Access Rights" which means that a user has the same access rights to all child objects if one has access to the object itself.

This can be overridden with the "User Group Access" option. You can specify the access rights to the current object for each user group by choosing an option from the drop down list:



The options are:

- Inherited: Uses the setting of the parent object
- None: User can not see or edit the object. The object does not show up in lists and in the sensor tree - unless a child object is visible to the user, then the object is visible in the sensor tree, yet not accessible.
- Read: User can see the object and review its monitoring status.
- Write: User can see the object, review its monitoring status and edit the object's settings - except for group access settings.
- Full: Same as "Write", but the User can additionally control the group access settings.

A user can only add and delete objects if the user has "Write" or "Full" access to the parent object.

You will see an additional checkbox for groups and devices, "Revert children's access rights to inherited". If you select this box, the access right of all child objects will be reset to "inherited" which actually deletes all individual right settings for the underlying objects. This is the quick way to reset all access rights and should be used with caution.

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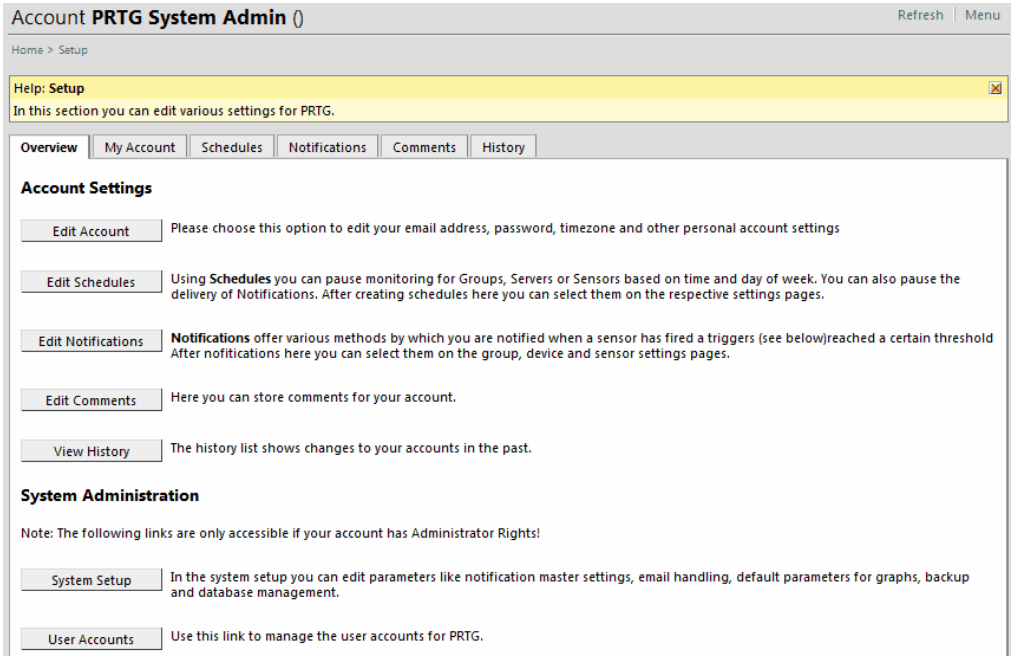
Part XIII

System Settings and Administration

13 System Settings and Administration

The settings for your account, the system settings and most of the system administration settings are available from the "Setup" menu in the web interface. Some settings (e.g. web server IP and port and license key) are located in the Server Admin Tool and Probe Admin Tool.


Account PRTG System Admin ()
Refresh
Menu
Home > Setup
Help: Setup
In this section you can edit various settings for PRTG.
Overview
My Account
Schedules
Notifications
Comments
History
Account Settings
Edit Account
Please choose this option to edit your email address, password, timezone and other personal account settings
Edit Schedules
Using Schedules you can pause monitoring for Groups, Servers or Sensors based on time and day of week. You can also pause the delivery of Notifications. After creating schedules here you can select them on the respective settings pages.
Edit Notifications
Notifications offer various methods by which you are notified when a sensor has fired a triggers (see below)reached a certain threshold After nofitications here you can select them on the group, device and sensor settings pages.
Edit Comments
Here you can store comments for your account.
View History
The history list shows changes to your accounts in the past.
System Administration
Note: The following links are only accessible if your account has Administrator Rights!
System Setup
In the system setup you can edit parameters like notification master settings, email handling, default parameters for graphs, backup and database management.
User Accounts
Use this link to manage the user accounts for PRTG.

Please read on in the following sections:

- Account Settings - My Account
- Account Settings - Schedules
- Account Settings - Notifications
- System Setup - Web Server
- System Setup - Probes
- System Setup - Notifications
- Core Server Admin Tool
- Probe Admin Tool

13.1 Account Settings - My Account

Under "My Account" you can change various settings specific to your user account:

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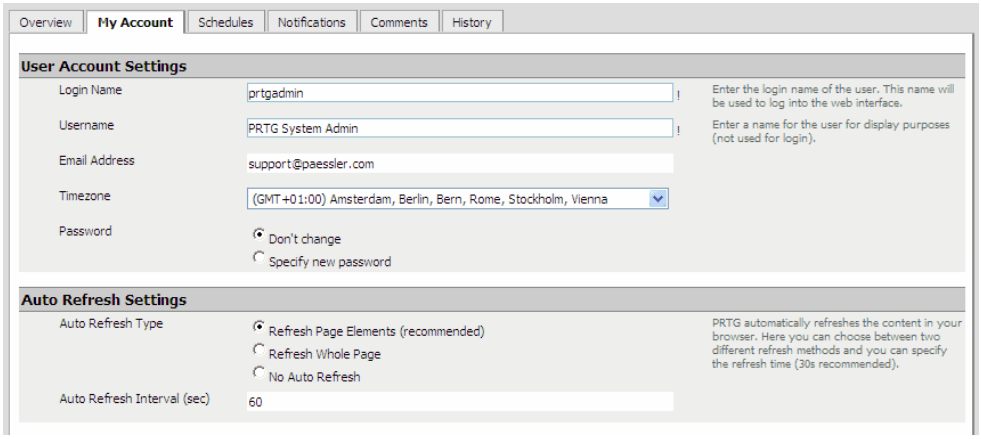
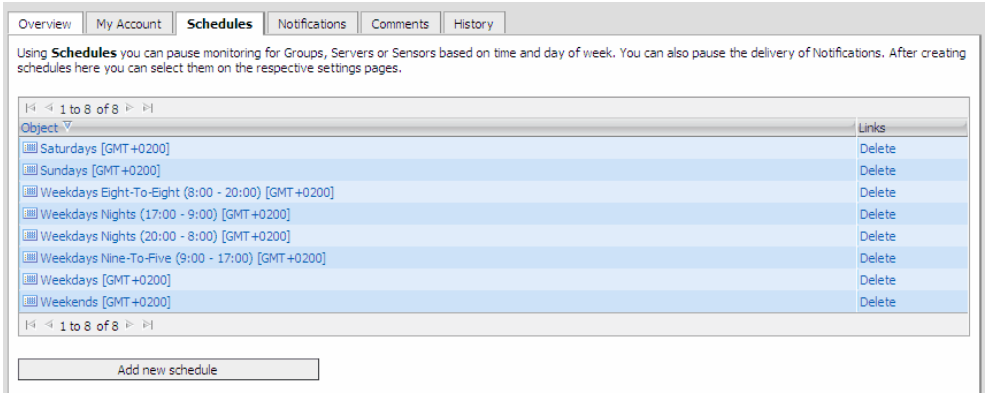

Overview
My Account
Schedules
Notifications
Comments
History
User Account Settings
Login Name
prtgadmin
Enter the login name of the user. This name will be used to log into the web interface.
Username
PRTG System Admin
Enter a name for the user for display purposes (not used for login).
Email Address
support@paessler.com
Timezone
(GMT+01:00) Amsterdam, Berlin, Bern, Rome, Stockholm, Vienna
Password
Don't change
Specify new password
Auto Refresh Settings
Auto Refresh Type
Refresh Page Elements (recommended)
Refresh Whole Page
No Auto Refresh
PRTG automatically refreshes the content in your browser. Here you can choose between two different refresh methods and you can specify the refresh time (30s recommended).
Auto Refresh Interval (sec)
60

This page allows to define the following information in detail:

- User Account Settings: These fields allow you to define the login name, the user name, the email address for the user, the time zone and allows you to set a new password.
- Auto Refresh Settings: Using these fields you can select whether you want the content of your browser to be refreshed automatically or not, if you want to merely refresh page elements or the entire page, and what refresh interval (in seconds) you want to use.
- Web Interface Settings: These fields allow you to select the charts display mode: select static images for faster graph processing or Flash for increased interactivity. You can further select to turn the contextual help on and off.
- Autofolding Settings for the Sensortree: PRTG tries to keep the page size for the pages with the sensor tree small by automatically "folding" groups and devices with many items. In these fields you can define how many groups/devices or how many sensors maximum are to be shown before the specific branch is reduced (folded).
- Account Control: These fields allow you to define to what group(s) the user in case belongs to, among other defining the user's access rights. Non-admin users can also be set to active or inactive by selecting the respective radio button (available for the admin only).

13.2 Account Settings - Schedules

Under "Schedules" users can define a timetable that can be used to pause monitoring for groups, servers or sensors based on time and day of week, as well as pause the delivery of notifications.


Overview
My Account
Schedules
Notifications
Comments
History
Using Schedules you can pause monitoring for Groups, Servers or Sensors based on time and day of week. You can also pause the delivery of Notifications. After creating schedules here you can select them on the respective settings pages.
1 to 8 of 8
Object
Links
Saturdays [GMT+0200]
Sundays [GMT+0200]
Weekdays Eight-To-Eight (8:00 - 20:00) [GMT+0200]
Weekdays Nights (17:00 - 9:00) [GMT+0200]
Weekdays Nights (20:00 - 8:00) [GMT+0200]
Weekdays Nine-To-Five (9:00 - 17:00) [GMT+0200]
Weekdays [GMT+0200]
Weekends [GMT+0200]
Delete
1 to 8 of 8
Add new schedule

Various common schedules are available by default, further schedules can be added using the "Add new schedule" button.

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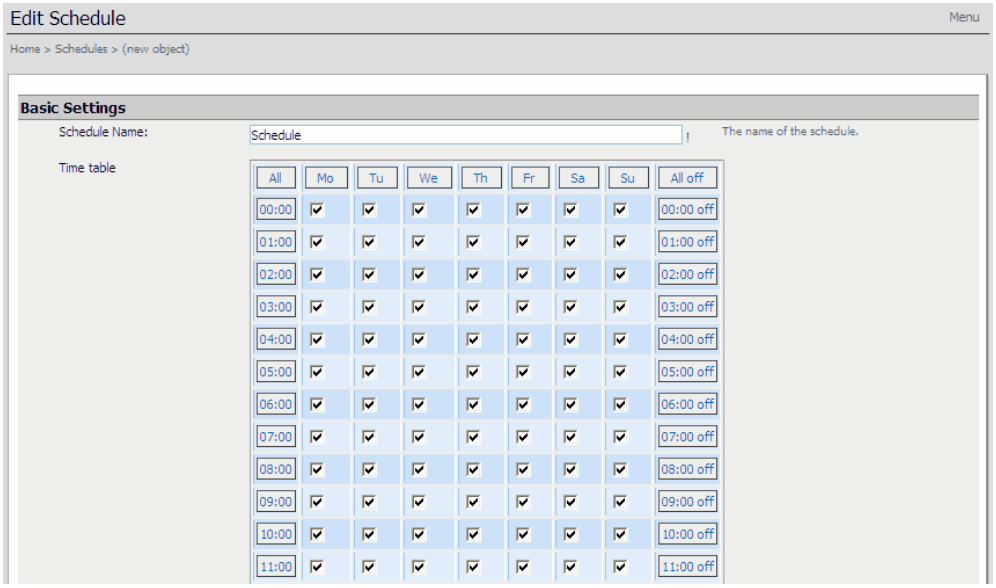
By either selecting an existing schedule or when adding a new schedule, the following window appears:



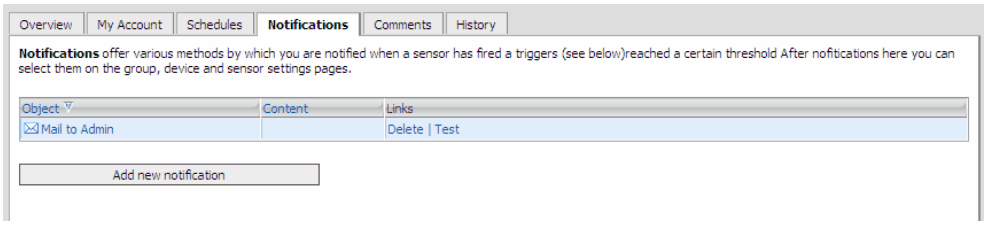
Here you can provide a schedule name for identification purposes, as well as check the respective checkboxes to determine the time range of the schedule. Clicking on the daily icons at the top or at the daily "off" icons at the bottom allow to select/deselect entire daily ranges. Clicking on the hourly icons on the left, or on the hourly "off" icons on the right, allow to select/deselect entire hourly ranges.

At the very bottom of the window, you can also assign user group access rights as pertains the selected schedule. The following rights can be assigned:

- None: This user group has no access to the schedule whatsoever. As such, this user group can not see or edit the specific schedule.
- Read: This user group has read access to the schedule. The group can see, but not edit, the specific schedule.
- Write: This user group has read and write access to the schedule. The group can see and edit the specific schedule.
- Full: This user group has read and write access to the schedule, plus it can assign schedule access rights to other user groups.

13.3 Account Settings - Notifications

Under "Notifications" you can discern an overview of all configured notifications (see Notifications).


Overview
My Account
Schedules
Notifications
Comments
History
Notifications offer various methods by which you are notified when a sensor has fired a triggers (see below)reached a certain threshold After notifications here you can select them on the group, device and sensor settings pages.
Object
Content
Links
Mail to Admin
Delete | Test
Add new notification

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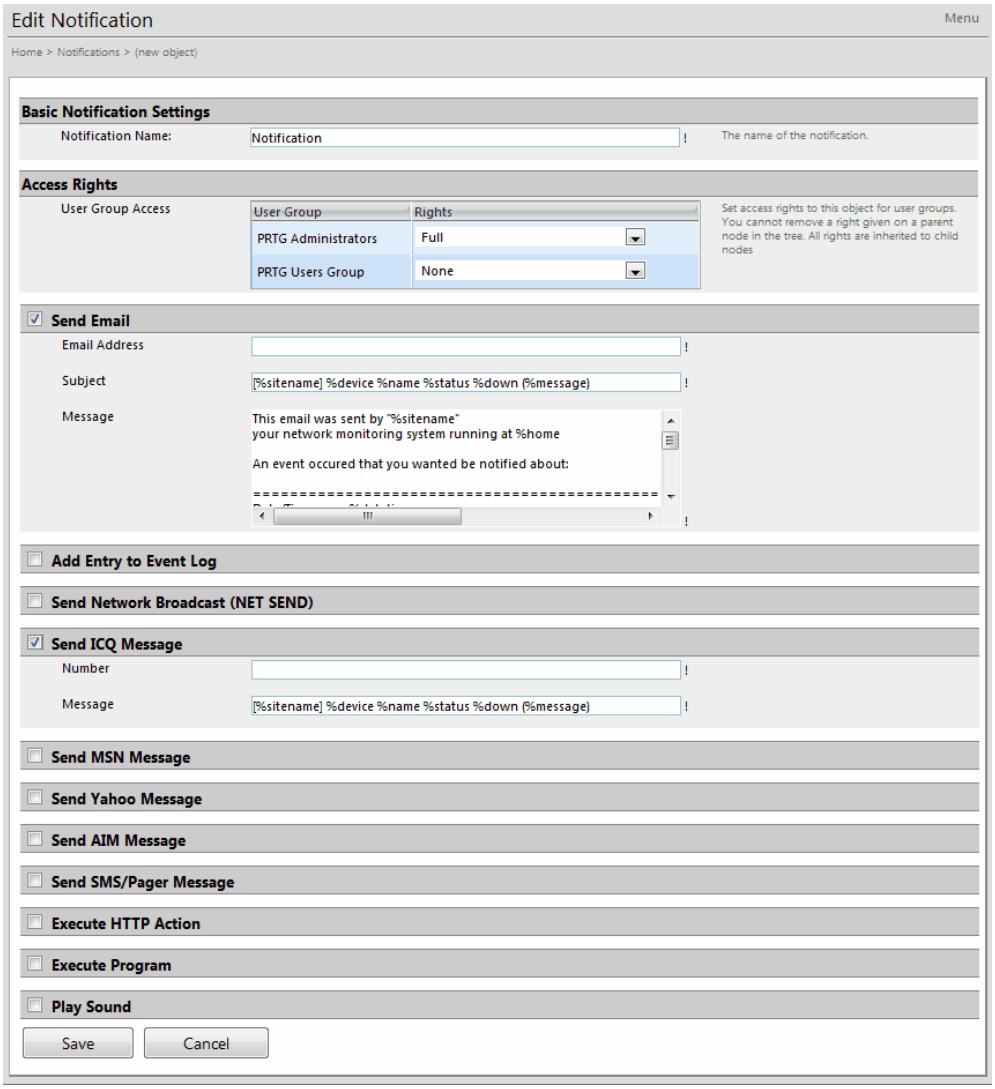
Clicking on any particular notification will direct you to the its configuration page. You can add a new notification by clicking on the "Add new notification" button. Use the "Delete" link to remove any particular notification or use the "Test" link to test any particular notification.

The edit page looks like this:



You can also assign user group access rights as pertains the selected notification. The following rights can be assigned:

- None: This user group has no access to the notification whatsoever. As such, this user group can not see or edit the specific notification.
- Read: This user group has read access to the notification. The group can see but not edit the specific notification.
- Write: This user group has read and write access to the notification. The group can see and edit the specific notification.
- Full: This user group has read and write access to the notification, plus it can assign notification access rights to other user groups.

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First you can enter a name for the notification and you can set the user group rights (e.g. if you want to enable or disable the use of a specific notification by some users).

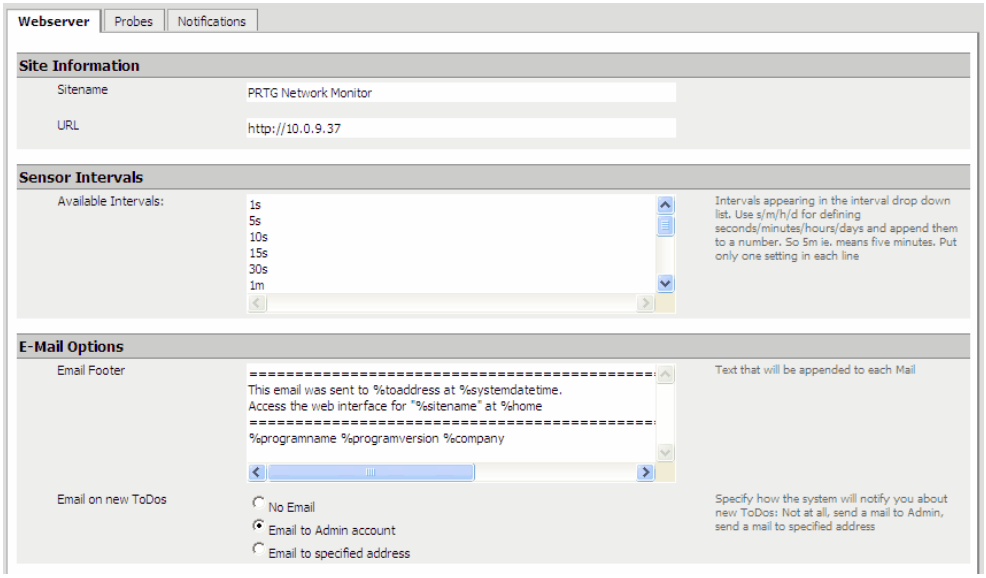
Using the checkboxes you can activate various methods of notification. For each method you must enter the receiver address. Optionally, you can also change the notification texts (the available placeholders are explained on the right).

Note: For notifications with instant messengers, it is important to understand that in order to use instant messaging for notifications you always need two accounts: One account that sends the messages and another one that receives the messages.

Important: For most notification methods, you must enter the sender information in the System Setup - Notifications screen.

13.4 System Setup - Web Server

Under the "Web Server" tab it is possible to define specifics relevant to the web server:


Webserver
Probes
Notifications
Site Information
Sitename
PRTG Network Monitor
URL
http://10.0.9.37
Sensor Intervals
Available Intervals:
1s
5s
10s
15s
30s
1m
Intervals appearing in the interval drop down list. Use s/m/h/d for defining seconds/minutes/hours/days and append them to a number. So 5m ie. means five minutes. Put only one setting in each line
E-Mail Options
Email Footer
This email was sent to %toaddress at %systemdatetime.
Access the web interface for "%sitename" at %home
%programname %programversion %company
Text that will be appended to each Mail
Email on new ToDos
No Email
Email to Admin account
Email to specified address
Specify how the system will notify you about new ToDos: Not at all, send a mail to Admin, send a mail to specified address

This page allows to define the following information in detail.

- Site Information: Here you can define a site name (used in the web interface and in the subject of emails), as well as the URL for the site (used for building links in emails). If you want to use a symbolic (DNS-) name to access PRTG's web server you must enter the name here.
- Sensor Intervals: Here you can define intervals which will in turn become selectable when adding objects to the installation. In order to add a new interval value merely add a numerical value followed by a time span enumerator (s/m/h/d for defining seconds/minutes/hours/days respectively).
- Email Options: Here you can edit the footer (for text-only mails) and HTML template that will be used for outgoing emails (placeholders allowed) and define whether "ToDo" emails are to be forwarded to the administrator, a specific email address or to no one at all. If "specific email" is selected, a new field appears allowing to define the email address in case.
- Data Purging Limits: Here you can select for how many days historic data remains accessible. Enter the number of days to retain historic data for each of the available entries.

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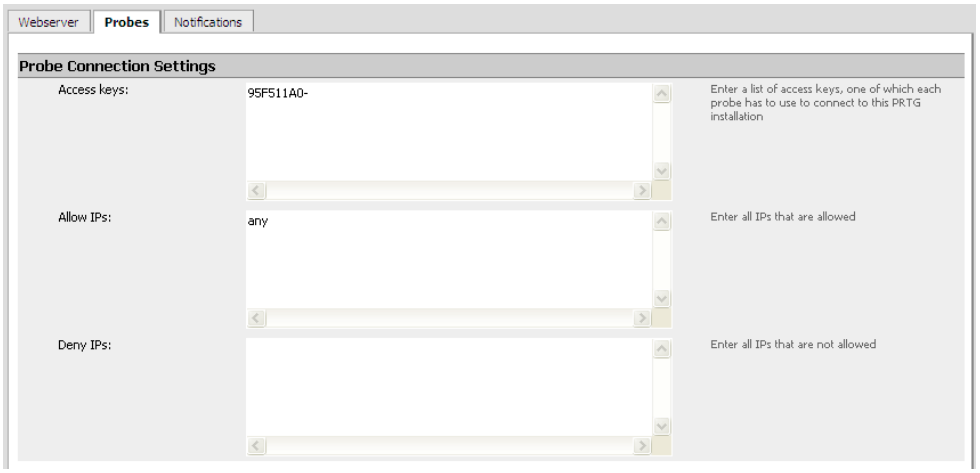
- Unusual Detection: Here you can define the sensitivity of the "unusual" state detection mechanism.
- Settings from the PRTG Server Administrator program: These entries are "for your information" only. These entries can be edited from the PRTG Server Administrator applet under Start | PRTG program group (see Core Server Admin Tool).

13.5 System Setup - Probes

Under the "Probes" tab it is possible to define specifics relevant to probes:



- Probe Connection Settings: Here you can define access keys, as well as allow / deny specifics IPs access to the probe(s). See Multiple Probes and Remote Probes.
- Settings from the PRTG Server Administrator program: These entries are "for your information" only. These entries can be edited from the PRTG Server Administrator applet under Start | PRTG program group (see Probe Admin Tool).

13.6 System Setup - Notifications

Under the "Notification" tab it is possible to define specifics relevant to notifications (see Notifications):

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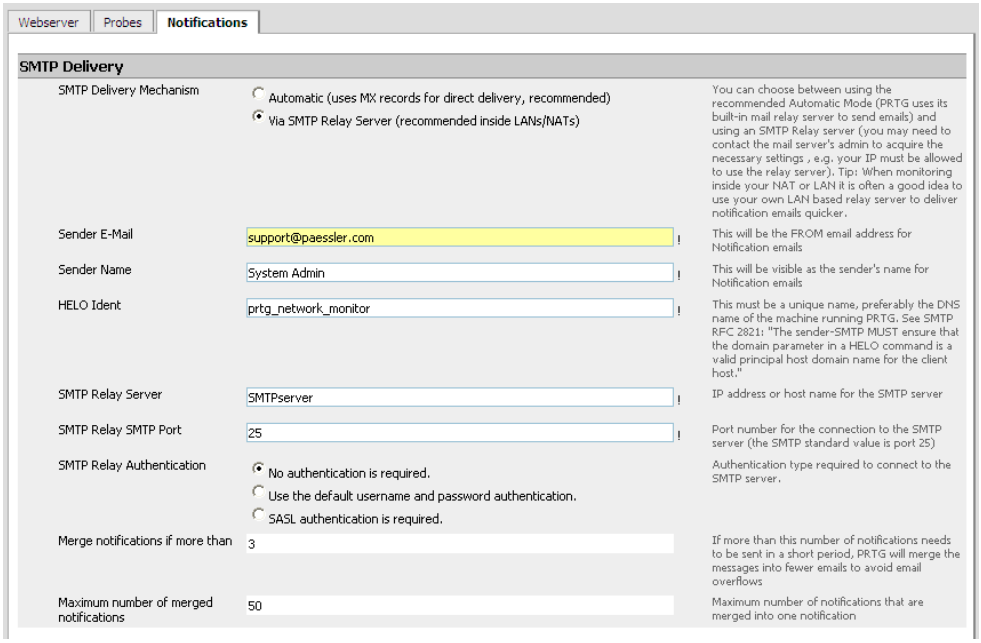
Webserver
Probes
Notifications
SMTP Delivery
SMTP Delivery Mechanism
Automatic (uses MX records for direct delivery, recommended)
Via SMTP Relay Server (recommended inside LANs/NATs)
You can choose between using the recommended Automatic Mode (PRTG uses its built-in mail relay server to send emails) and using an SMTP Relay server (you may need to contact the mail server's admin to acquire the necessary settings , e.g. your IP must be allowed to use the relay server). Tip: When monitoring inside your NAT or LAN it is often a good idea to use your own LAN based relay server to deliver notification emails quicker.
Sender E-Mail
support@paessler.com
This will be the FROM email address for Notification emails
Sender Name
System Admin
This will be visible as the sender's name for Notification emails
HELO Ident
prtg_network_monitor
This must be a unique name, preferably the DNS name of the machine running PRTG. See SMTP RFC 2821: "The sender-SMTP MUST ensure that the domain parameter in a HELO command is a valid principal host domain name for the client host."
SMTP Relay Server
SMTPserver
IP address or host name for the SMTP server
SMTP Relay SMTP Port
25
Port number for the connection to the SMTP server (the SMTP standard value is port 25)
SMTP Relay Authentication
No authentication is required.
Use the default username and password authentication.
SASL authentication is required.
Authentication type required to connect to the SMTP server.
Merge notifications if more than
3
If more than this number of notifications needs to be sent in a short period, PRTG will merge the messages into fewer emails to avoid email overflows
Maximum number of merged notifications
50
Maximum number of notifications that are merged into one notification

Note: It is important to understand that in order to use instant messaging for notifications you always need two accounts: One account that sends the messages and another one that receives the messages.

This page allows to define the following information in detail.

- SMTP Delivery: Here you can define the SMTP delivery mechanism (either use PRTG's automatic relay or define your own SMTP server), as well as all relevant information for email forwarding. If you select to define your own SMTP server, you will need to provide your server's information, including the server itself (use either IP address or DNS name), the SMTP port, as well as the relay authentication type (standard or SASL). If you require authentication, username and password need to be provided. Furthermore, it is possible to define when PRTG should start merging individual notifications, as well as provide a maximum number of notifications to be merged at any given time (this will reduce the number of mails that you will receive).
- SMS Delivery: From the drop-down, select your SMS gateway provider. Furthermore, provide your gateway's access username and password.
- ICQ Delivery: Provide your ICQ number and password for the account intended to relay (not receive!) ICQ notifications.
- Windows Live Messenger (MSN Messenger) Delivery: Provide your MSN ID and password for the account intended to relay (not receive!) MSN notifications.
- Yahoo! Messenger Delivery: Provide your Yahoo! Messenger ID and password for the account intended to relay (not receive!) Yahoo! Messenger notifications.
- AOL Instant Messenger Settings: Provide your AIM ID and password for the account intended to relay (not receive!) AIM notifications.

13.7 Core Server Admin Tool

The Core Server Admin Tool can be started from the "START | PRTG Network Monitor" program group and allows to configure implemented probes. The Core Server Admin Tool is divided into eight tabs:

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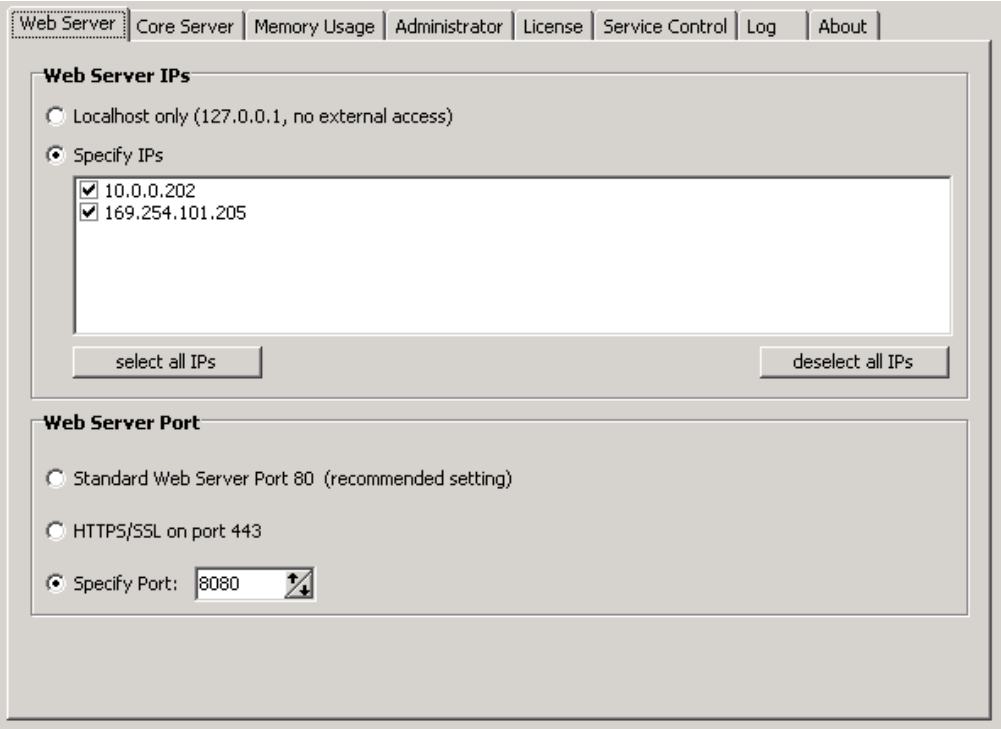
Web Server



Under the Web Server tab you can define the web server IP addresses. You can select to use local host only (which means that no external access will be possible. This is the most secure setting) or specify individual IPs from a list provided. You can further define the web server port to use. The options are:

- Standard Web Server Port 80: This is the standard port used and recommended for most installations.
- HTTPS/SSL on port 443: Website can only be used via secure SSL ("https://(your IP)").
- Specify Port: Enter a port number of your choice.

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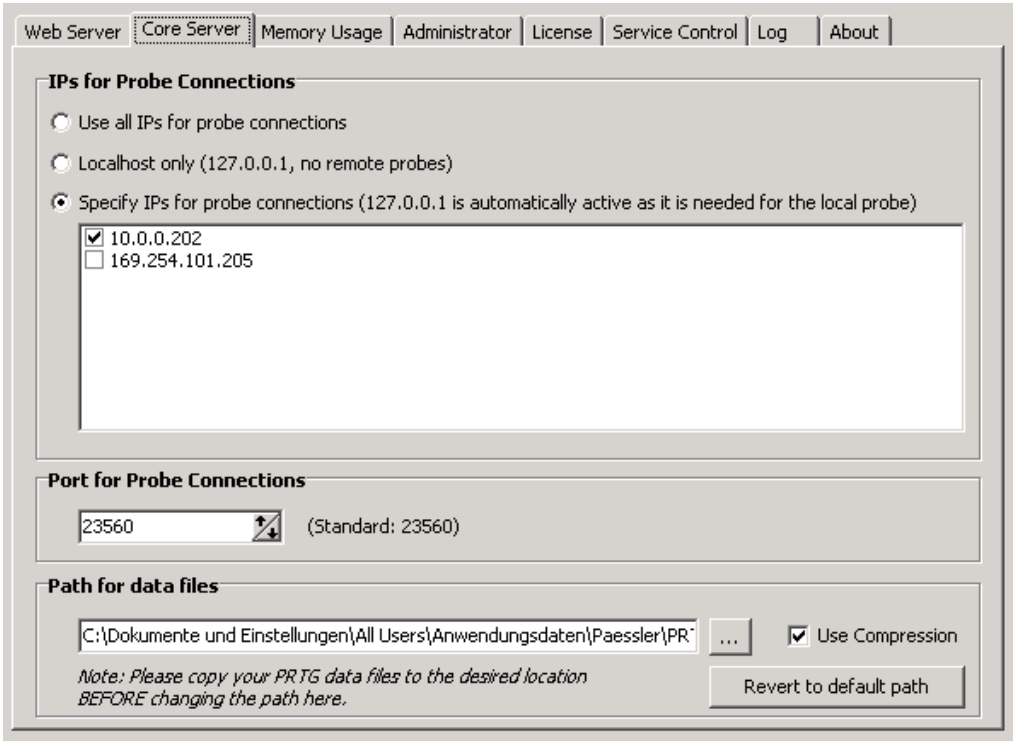
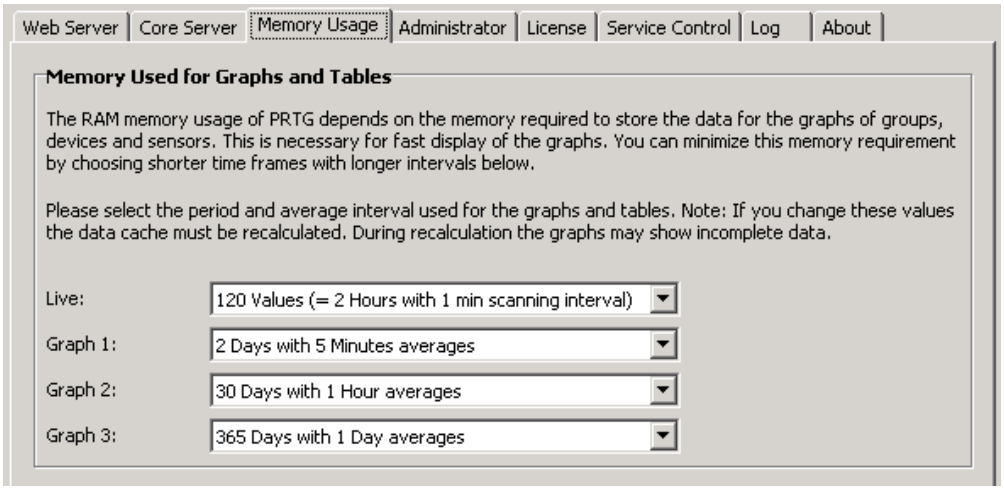
Core Server



Under the Core Server tab you can define the IPs for probe connections. The connection between core and probe is initiated by the probe 9see Multiple Probes and Remote Probes). You can select to use all IPs, localhost only or individual IPs from the list provided. You can further define the port for probe connections, as well as define a path for all core server data files (you can optionally turn on compression and revert to the default path by clicking on the respective element).

Memory Usage


Web Server
Core Server
Memory Usage
Administrator
License
Service Control
Log
About
Memory Used for Graphs and Tables
The RAM memory usage of PRTG depends on the memory required to store the data for the graphs of groups, devices and sensors. This is necessary for fast display of the graphs. You can minimize this memory requirement by choosing shorter time frames with longer intervals below.
Please select the period and average interval used for the graphs and tables. Note: If you change these values the data cache must be recalculated. During recalculation the graphs may show incomplete data.
Live:
120 Values (= 2 Hours with 1 min scanning interval)
Graph 1:
2 Days with 5 Minutes averages
Graph 2:
30 Days with 1 Hour averages
Graph 3:
365 Days with 1 Day averages

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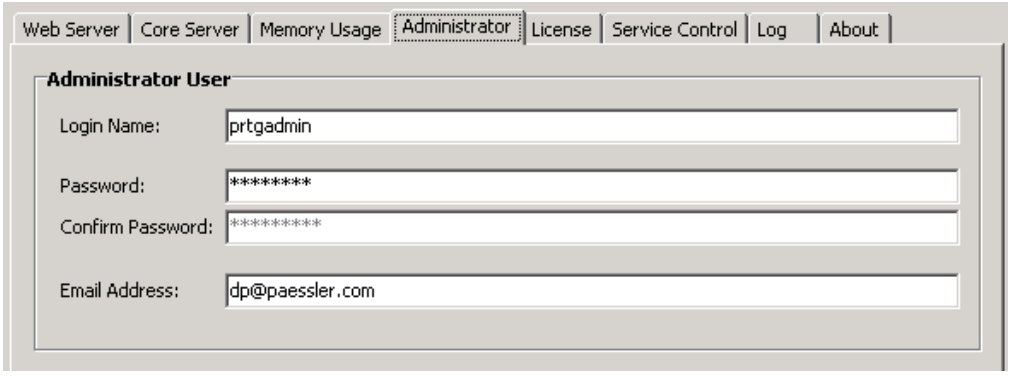
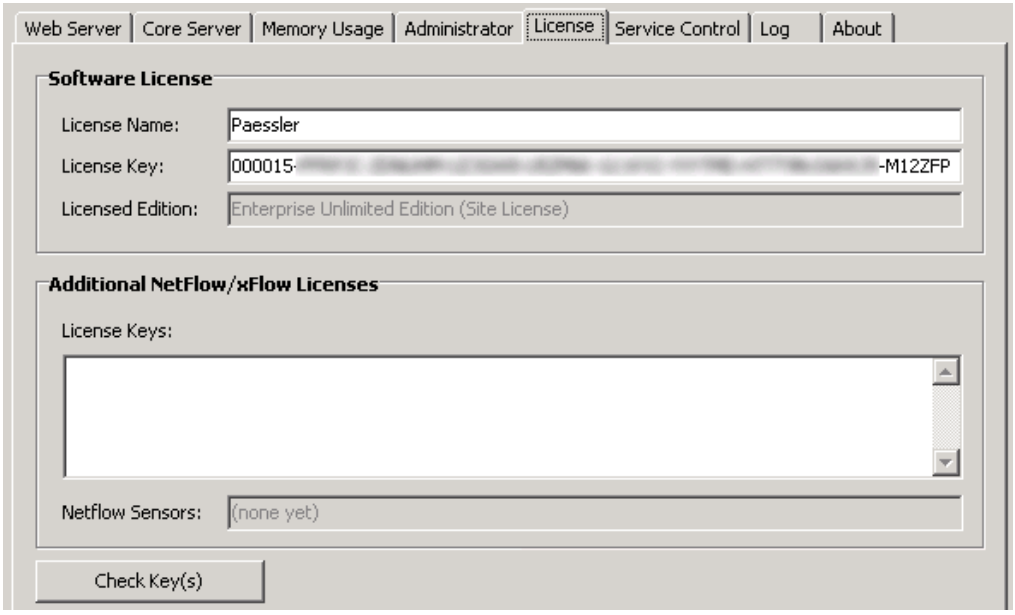
Under the Memory Usage tab you can define timeframes for live graphs, as well as the other three standard graphs displayed under PRTG. You can reduce memory usage by decreasing the graph time frame and increasing the intervals.

Administrator



Under the Administrator tab you can define the login name, the password and the email address of the administrator user.

License



Under the License tab you can enter your program license information (name and key, which will return a license edition value), as well as Netflow/xFlow add-on licenses. Once the licensing information has been entered click on the "Check Key(s)" button to check and activate the same.

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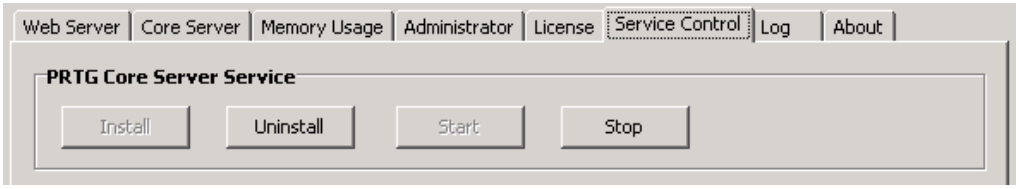
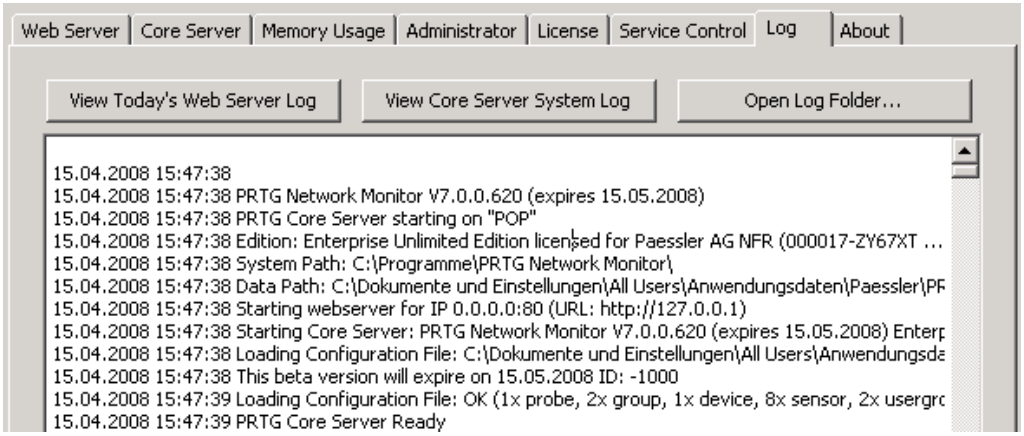
Service Control



Under the Service Control tab you can install/uninstall, as well as start/stop the core service.

Log


Web Server
Core Server
Memory Usage
Administrator
License
Service Control
Log
About
View Today's Web Server Log
View Core Server System Log
Open Log Folder...
15.04.2008 15:47:38
15.04.2008 15:47:38 PRTG Network Monitor V7.0.0.620 (expires 15.05.2008)
15.04.2008 15:47:38 PRTG Core Server starting on "POP"
15.04.2008 15:47:38 Edition: Enterprise Unlimited Edition licensed for Paessler AG NFR (000017-ZY67XT ...
15.04.2008 15:47:38 System Path: C:\Programme\PRTG Network Monitor\
15.04.2008 15:47:38 Data Path: C:\Dokumente und Einstellungen\All Users\Anwendungsdaten\Paessler\PR
15.04.2008 15:47:38 Starting webserver for IP 0.0.0.0:80 (URL: http://127.0.0.1)
15.04.2008 15:47:38 Starting Core Server: PRTG Network Monitor V7.0.0.620 (expires 15.05.2008) Enterp
15.04.2008 15:47:38 Loading Configuration File: C:\Dokumente und Einstellungen\All Users\Anwendungsda
15.04.2008 15:47:38 This beta version will expire on 15.05.2008 ID: -1000
15.04.2008 15:47:39 Loading Configuration File: OK (1x probe, 2x group, 1x device, 8x sensor, 2x usergro
15.04.2008 15:47:39 PRTG Core Server Ready

Under the Log tab you can view the current day's web server log, the core server system logs or directly open the core's log file directory.

13.8 Probe Admin Tool

The Probe Admin Tool can be started from the "START | PRTG Network Monitor" program group and allows to configure implemented probes. The Probe Admin Tool is divided into four tabs:

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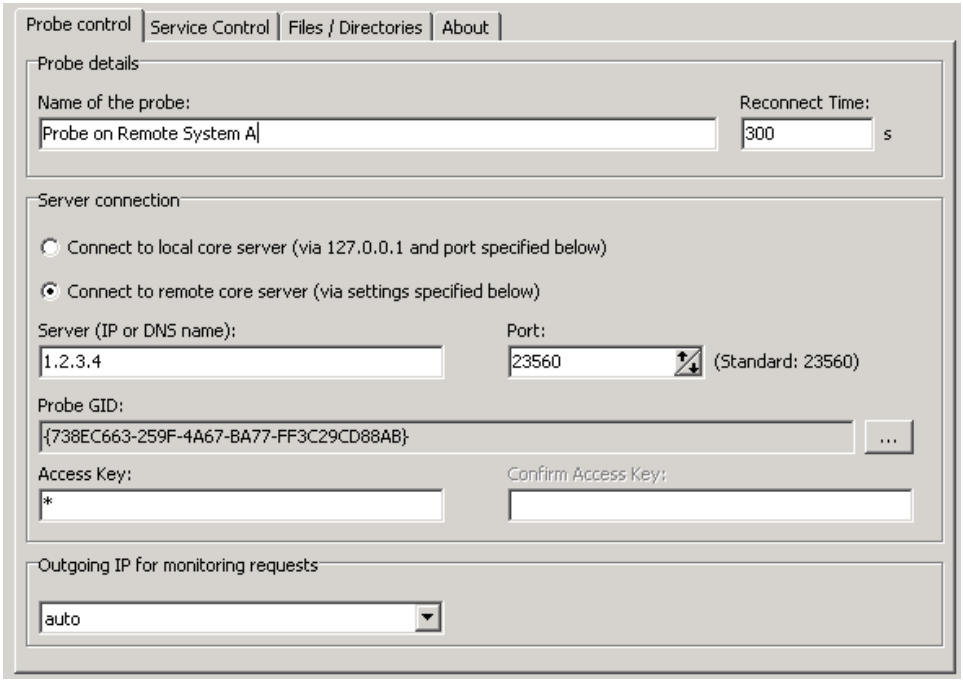
Probe Control



Under the Probe Control tab you can define

- Name of the probe (the name will be shown in the web interface).
- Server Connection: the server's IP or DNS name, as well as the server's port and the probe's access key (these settings must match the settings in the Core Admin Tool, see Multiple Probes and Remote Probes).
- Probe's GID, the unique identifier for each probe (use with extreme caution!).
- Reconnect time (in seconds) which is the time between two connection attempts when the core can't be reached.
- Outgoing IP for monitoring requests: Choose the IP address that all outgoing monitoring requests should use. The setting "auto" is recommended (e.g. it automatically chooses the right IP on multi-homed systems).

Service Control

Under the Service Control tab you can install/uninstall, as well as start/stop the probe service.

Files / Directories

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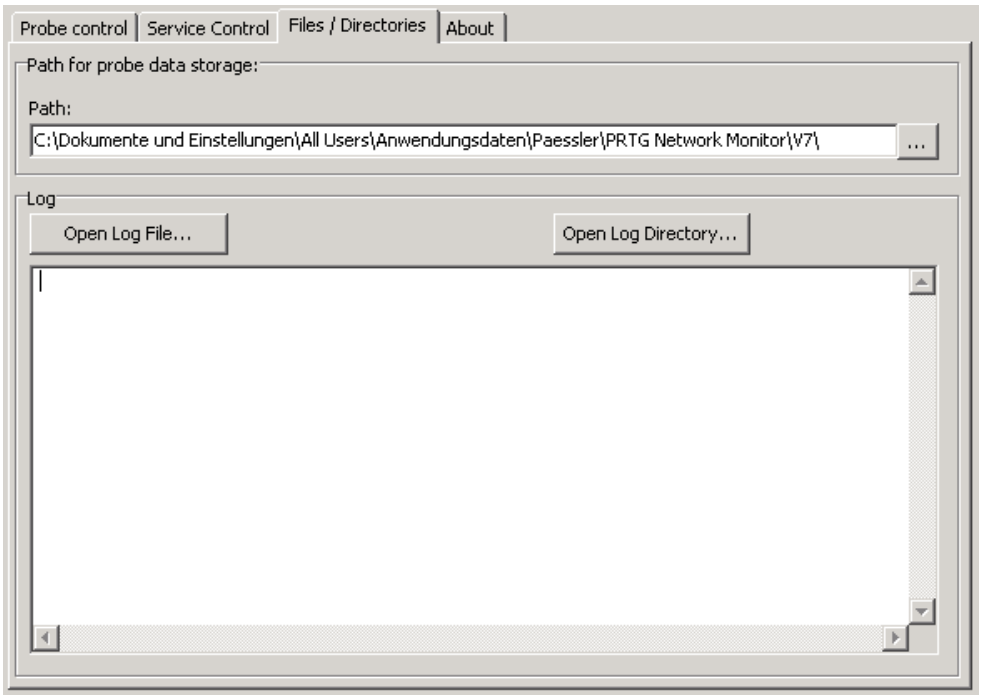

Under the Files/Directories tab you can select a path specifying where probe data is to be stored. You can further open the probe log files and the probe's log file directory.

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Part XIV

Advanced Topics

14 Advanced Topics

The chapter covers various advanced topics for PRTG Network Monitor:

- Toplists
- Multiple Probes and Remote Probes
- Copying Devices by Cloning or Using Device Templates
- Importing Data from PRTG Traffic Grapher 6 or IPCheck Server Monitor 5
- Installing an SSL Certificate for the Web Server
- Using the PRTG API (Application Programming Interface)
- Interface Definition for Custom EXE Sensors

14.1 Toplists

Packet Sniffing and NetFlow sensors can not only measure the total bandwidth usage, they can also break down the traffic by IP address, port, protocol, and other parameters. The results are shown in so-called "toplists". This way PRTG is able to tell which IP address, connection or protocol uses the most bandwidth. PRTG looks at all network packets (or streams) and collects the bandwidth information for all IPs, ports and protocols. At the end of the toplist period PRTG stores only the top entries of each in its database.

Why are only the top entries stored?

Storing all the data in a database that becomes available during the analysis process would create a huge amount of data which would be very slow to transfer between probe and core and also retrieving data would be too slow. By storing only the top 100 entries for short periods of time it is possible to reduce the amount of data to a minimum while still being able to find bandwidth hogs.

Accessing Toplists

To access the toplists for a packet sniffing or NetFlow sensor click the "toplist" tab on the sensor's detail page:

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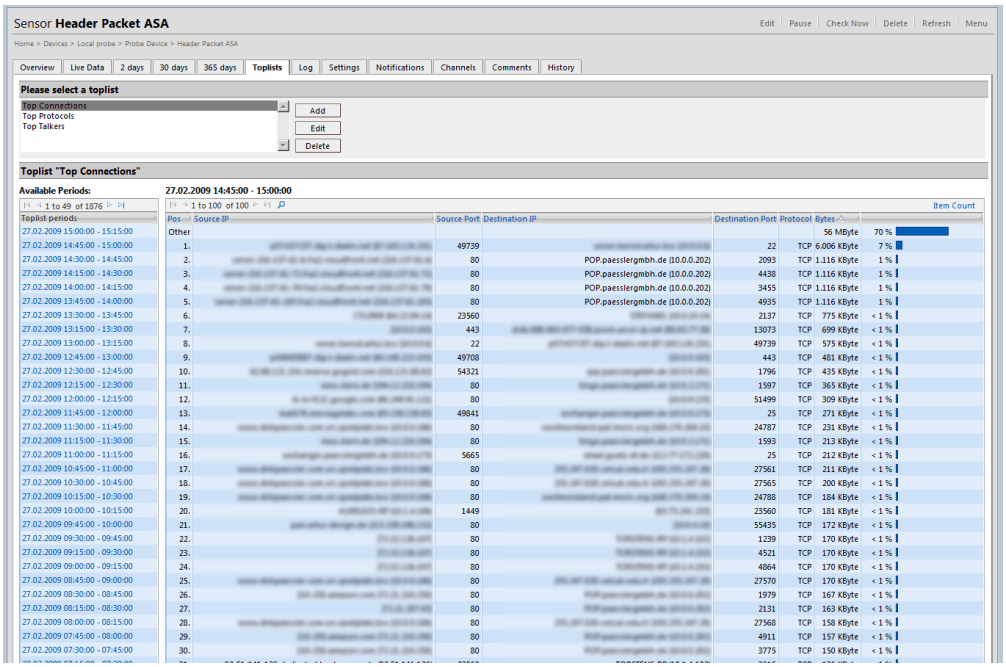
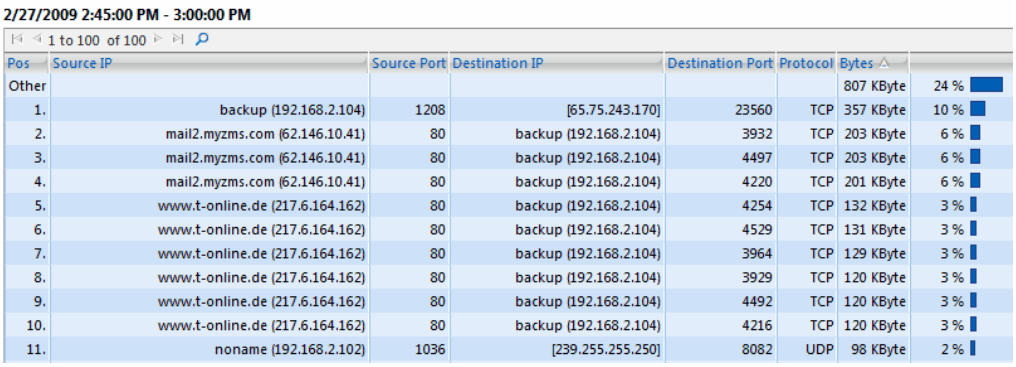


You can select a toplist in the list at the top. You can select the time period on the left.



2/27/2009 2:45:00 PM - 3:00:00 PM

1 to 100 of 100

Pos	Source IP	Source Port	Destination IP	Destination Port	Protocol	Bytes	
Other						807 KByte	24 %
1.	backup (192.168.2.104)	1208	[65.75.243.170]	23560	TCP	357 KByte	10 %
2.	mail2.myzms.com (62.146.10.41)	80	backup (192.168.2.104)	3932	TCP	203 KByte	6 %
3.	mail2.myzms.com (62.146.10.41)	80	backup (192.168.2.104)	4497	TCP	203 KByte	6 %
4.	mail2.myzms.com (62.146.10.41)	80	backup (192.168.2.104)	4220	TCP	201 KByte	6 %
5.	www.t-online.de (217.6.164.162)	80	backup (192.168.2.104)	4254	TCP	132 KByte	3 %
6.	www.t-online.de (217.6.164.162)	80	backup (192.168.2.104)	4529	TCP	131 KByte	3 %
7.	www.t-online.de (217.6.164.162)	80	backup (192.168.2.104)	3964	TCP	129 KByte	3 %
8.	www.t-online.de (217.6.164.162)	80	backup (192.168.2.104)	3929	TCP	120 KByte	3 %
9.	www.t-online.de (217.6.164.162)	80	backup (192.168.2.104)	4492	TCP	120 KByte	3 %
10.	www.t-online.de (217.6.164.162)	80	backup (192.168.2.104)	4216	TCP	120 KByte	3 %
11.	noname (192.168.2.102)	1036	[239.255.255.250]	8082	UDP	98 KByte	2 %

PRTG tries to show a DNS name for each IP addresses by performing reverse DNS requests. Each entry of the list shows the IPs, Ports, etc. (depending on the toplist type) and the total number of bytes for this entry during the toplist period. The last column displays the bandwidth of each entry as a percentage of the total bandwidth.

Configuring Toplists

In order to edit an existing toplist or to add a new toplist click the respective buttons next to the list of toplists.

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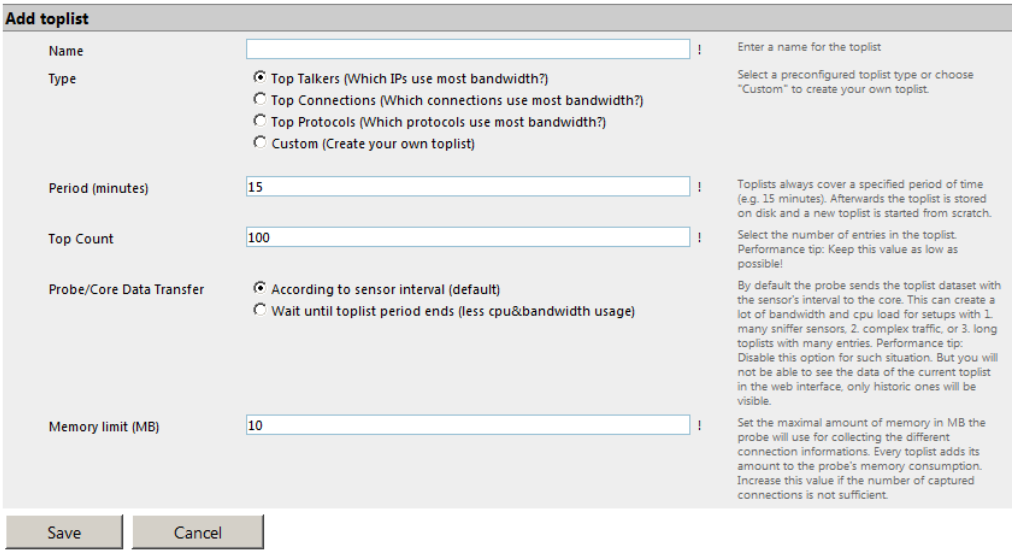
Add toplist
Name
Enter a name for the toplist
Type
Top Talkers (Which IPs use most bandwidth?)
Top Connections (Which connections use most bandwidth?)
Top Protocols (Which protocols use most bandwidth?)
Custom (Create your own toplist)
Select a preconfigured toplist type or choose "Custom" to create your own toplist.
Period (minutes)
15
Toplists always cover a specified period of time (e.g. 15 minutes). Afterwards the toplist is stored on disk and a new toplist is started from scratch.
Top Count
100
Select the number of entries in the toplist. Performance tip: Keep this value as low as possible!
Probe/Core Data Transfer
According to sensor interval (default)
Wait until toplist period ends (less cpu&bandwidth usage)
By default the probe sends the toplist dataset with the sensor's interval to the core. This can create a lot of bandwidth and cpu load for setups with 1. many sniffer sensors, 2. complex traffic, or 3. long toplists with many entries. Performance tip: Disable this option for such situation. But you will not be able to see the data of the current toplist in the web interface, only historic ones will be visible.
Memory limit (MB)
10
Set the maximal amount of memory in MB the probe will use for collecting the different connection informations. Every toplist adds its amount to the probe's memory consumption. Increase this value if the number of captured connections is not sufficient.
Save
Cancel

For the toplist type you have 4 options:

- Top Talkers (Which IPs use most bandwidth?)
- Top Connections (Which connections use most bandwidth?)
- Top Protocols (Which protocols use most bandwidth?)
- Custom (Create your own toplist)

For the "Custom" option you can select the parameters used while creating the toplists. The fields available depend on the sensor type and include Source IP, Source Port, Destination IP, Destination Port, Source MAC, Destination MAC, Protocol, Ether Type, ToS, Channel, IP (combined), Port (combined), MAC (combined). Apart from the list type you can also set the period and number of entries in the list.

Toplists for Connections With A Lot of Traffic

If you create toplists for data lines with considerable usage (e.g. steady bandwidth over 10 Mbit/s) or if the traffic is very diverse (i.e. many IPs/ports with only little traffic each) please consider the following aspects:

- The probe gathers all information needed for the toplist in RAM memory during each period. Only the top 100 entries are transferred to the core. Depending on the toplist type and traffic patterns the required memory can grow into many megabytes.
- Choose periods as short as desirable (especially important when traffic has a high level of diversity) to minimize memory usage.
- Memory requirements can grow almost exponentially with each field used in the toplists definition (depending on traffic pattern). Avoid complex toplists for high and diverse traffic (e.g. "Top Connections" (5 fields) needs a lot more memory than "Top Talkers" (1 field)).
- If you experience high bandwidth usage between core and probe try to choose "Wait until toplist period ends" (data is only transferred to the core once per period).
- If you experience "Data incomplete, memory limit was exceeded" messages try to increase the memory limit in the toplist's settings but keep an eye on the probe process' memory usage.

Notes

- Note 1: When working with toplists be aware that privacy issues can come up for certain configurations of this feature. Using Toplists you can track all single connections of an individual PC to the outside world and you, as the administrator, must make sure that it is legal for you to configure PRTG like this.

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- Note 2: Keep in mind that toplists can be viewed through the web interface. You may not want to show lists of domains used in your network to others. So you should restrict access to sensors having toplists.

14.2 Multiple Probes and Remote Probes

PRTG has two modules that perform the monitoring: The core server, which handles data storage, web server and a lot more, as well as one or more "probes" which perform the actual monitoring.

How Probes Work

As soon as a Probe starts work it automatically connects to its Core Server, downloads the sensor configuration and begins its monitoring tasks. The core server sends new configuration data to a probe as soon as the monitoring configuration is changed by the user. Probes monitor autonomously and send the monitoring results back to the core server for each check they have performed. If the connections between core and probe fails for any reason (e.g. a reboot of the core) the probe continues its monitoring and stores the results.

The connection between probe and core is initiated by the probe, secured using SSL (Secure Sockets Layer). This means that the data sent back and forth between core and probe is not visible to someone capturing data packets. The core server provides an open TCP/IP port and waits for connection attempts from probes. If a new probe connects for the first time the administrator will receive a ToDo and will then see the new probe in the sensor tree. As a security precaution, the probe must be manually approved by the administrator (Click on "accept") before any sensors can be created and monitored. The admin can also deny a probe which will then be disconnected. No further connection attempts will be accepted (the probe IP is added to the "Deny IPs" list in the probe system settings). This ensures that unauthorized probes can not connect to a core server.

Since the probe initiates the connection, you must ensure that it can be created from the outside world onto your core server, e.g. you may need to open any necessary ports in your firewall and you may need to specify a NAT rule for your network. The process is the same when you want to allow access to the web server of the core server via port 80.

Note: The local probe is automatically configured and approved and connects to the core via localhost (127.0.0.1) and SSL.

Situations That Require Monitoring Using Remote Probes

Upon installation, PRTG creates the first probe automatically called the "local probe". The local probe runs on the same machine as the core server and monitors all sensors from this system. Working with only one local probe should suffice for LAN monitoring and if you have just one location that you need monitoring for.

However, there are several situations that make it necessary to work with multiple probes or remote probes:

- If you have more than one location and you need to make sure that services are available from all locations.
- If your network is separated in several LANs by firewalls and the local probe can not monitor specific services across the firewalls.
- If you need to monitor systems in VPNs across public or in-secure data lines.
- If you want to sniff packets on another computer.
- If you want to monitor NetFlow data on another computer.
- If you experience performance issues with CPU intensive sensors like packet sniffing or NetFlow sensors and need to distribute the load onto more than one PC.

The following chart shows an example: The PRTG Core Server inside the LAN (top left) is able

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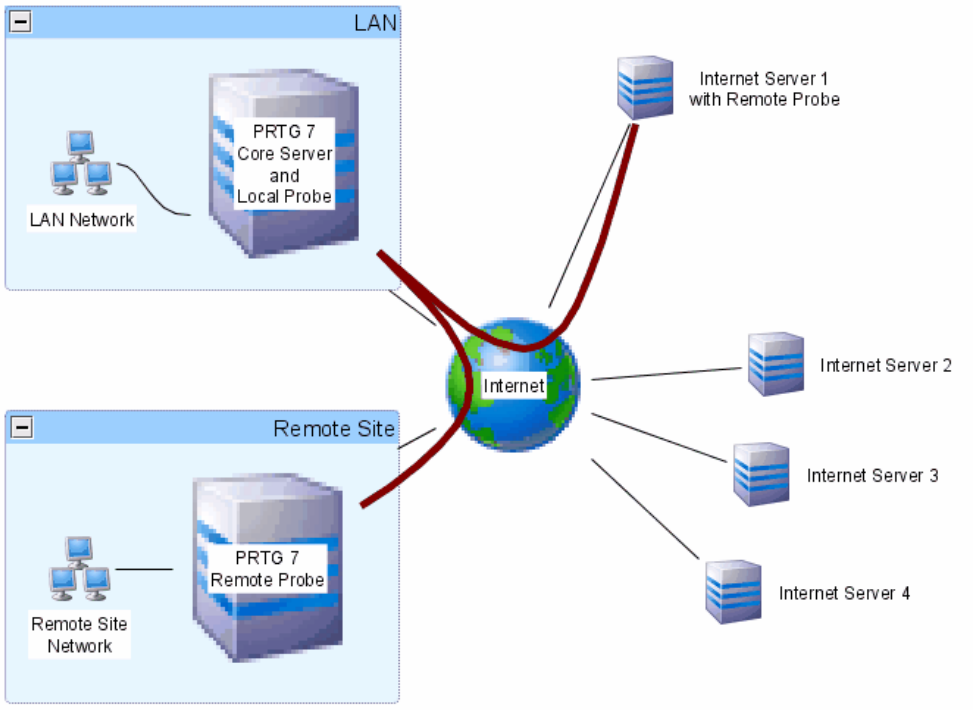
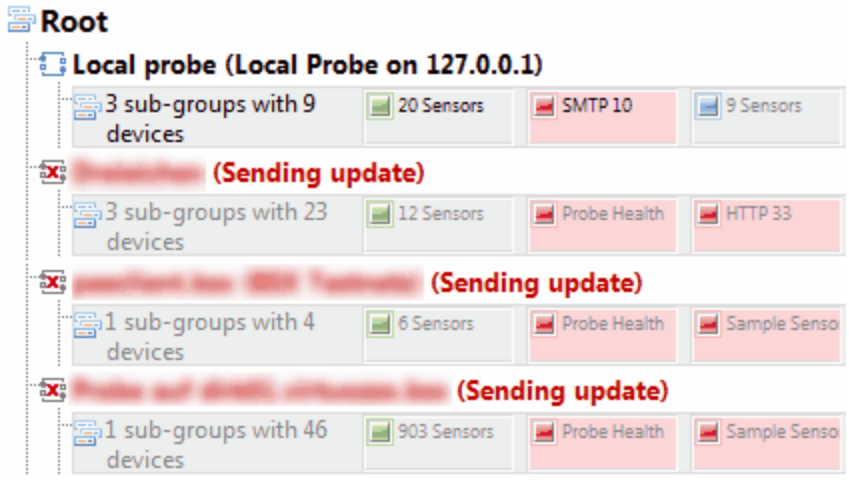
- to monitor secured services inside the "LAN" using the local probe
- to monitor secured services inside the "Remote Site" (bottom left) using a Remote Probe installed on a dedicated probe server
- to monitor secured services on "Internet Server 1" using a Remote Probe installed directly on this server
- to monitor public services on "Internet Servers 1, 2, and 3" via the Internet using any of the probes.



Automatic Probe Updating

Whenever a new version of PRTG is installed on the core server all remote probes will automatically download and install the updated version of the probe as soon as they reconnect to the updated core. Here is a screenshot of the “Devices” page of a PRTG installation shortly after the restart of a core server that has been updated to the latest PRTG version:



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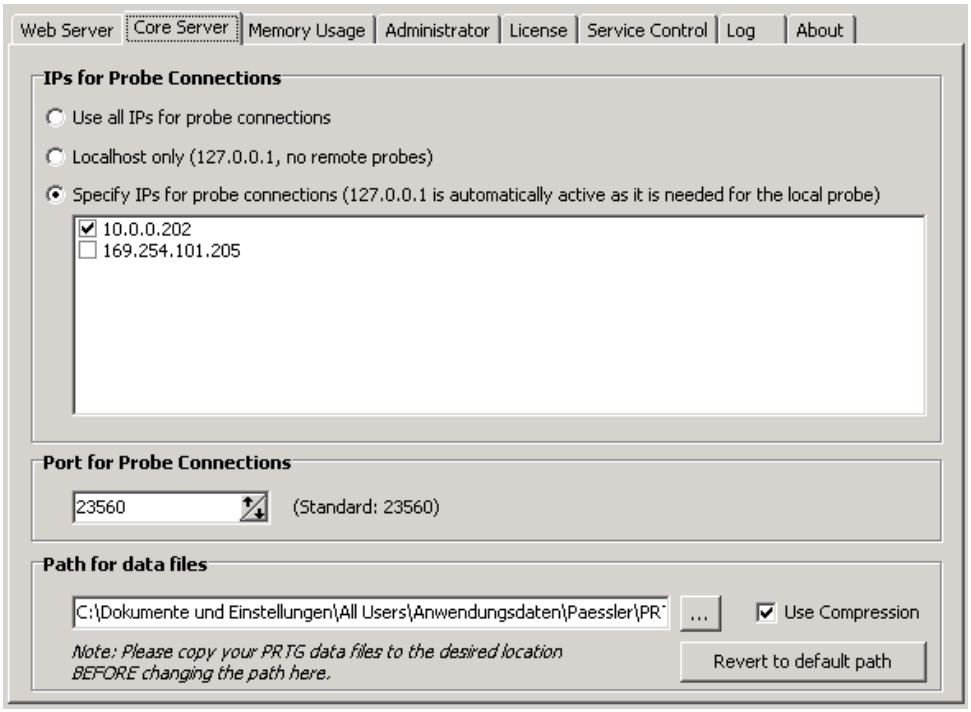
The local probe has already been updated during the core installation. All other probes are automatically downloading the new binaries of the “PRTG probe” using the SSL-secured probe/core connection. The download of the 4 MB file takes between a few seconds (in LANs) and a few minutes (over WAN connections), depending on the available bandwidth. As soon as the update has been downloaded the probe disconnects, installs the update and reconnects to the core server. This takes between 20 and 100 seconds. Please note that during the update phase the monitoring of the local probe can be affected due to the bandwidth required for the downloads.

Step 1: Preparing a Core Server for Remote Probes

Before remote probes can connect to a core server you must edit the relevant settings in the core server administrator tool which you can find in PRTG's Start menu group:



Be default, a core server only accepts connections via localhost (127.0.0.1) which means that only the local probe can connect. This is the most secure setting. In order to allow external probes to connect you must check "Use all IPs..." or "Specify IPs..." and select one of the IPs of the server. You can also specify the TCP/IP port number.

When you are done, click "OK" to save your settings. The core server process will be restarted so that the changes take effect.

Step 2: Setting up Remote Probes

To install a remote probe go to the web interface of the Core Server installation, go to "Setup|Download", download the Remote Probe Installer and run it. At the end of the installation the Probe Administrator will be started (or you can start it manually from the Start menu later) and you can enter the settings:

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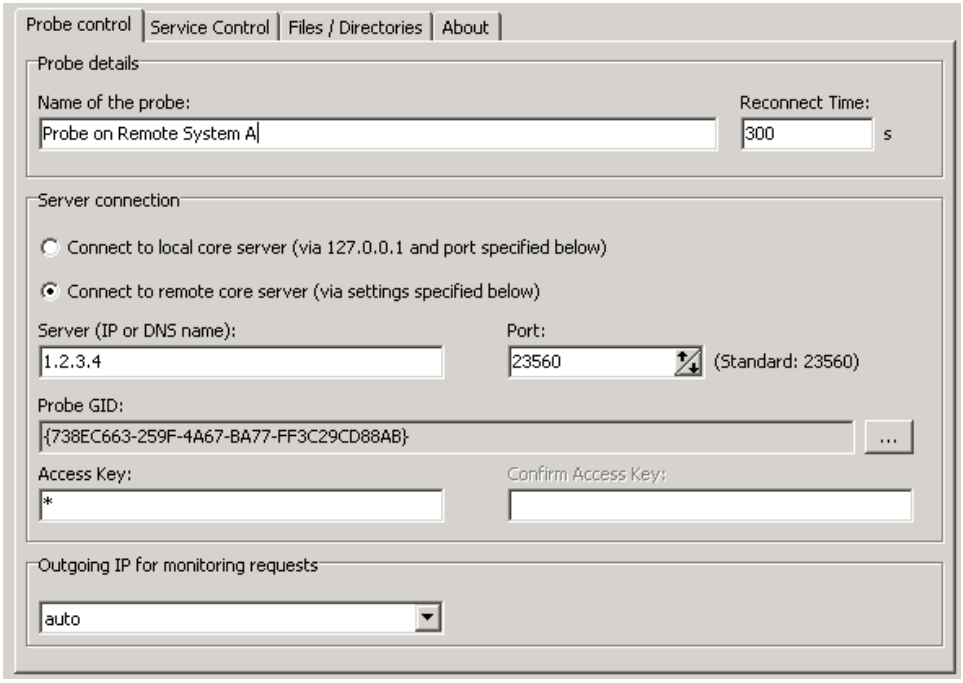
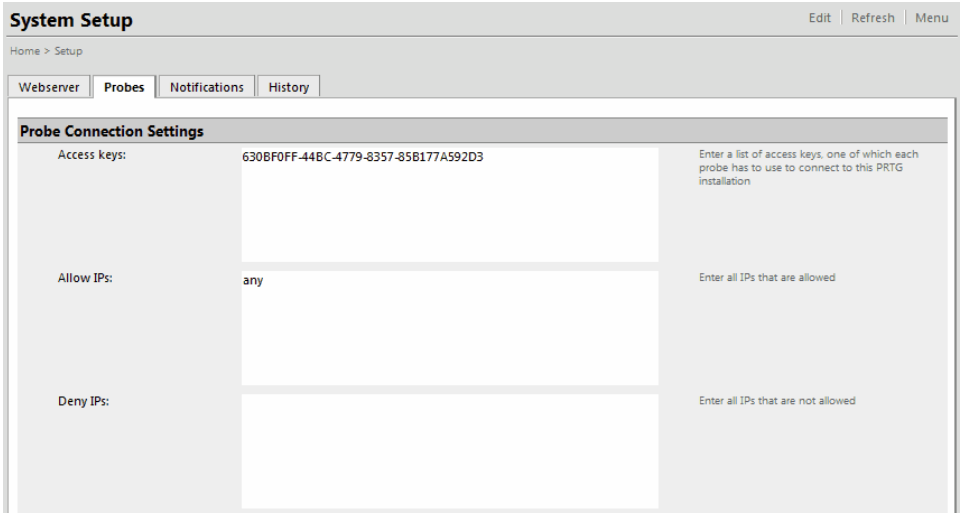


The important settings are (See Probe Admin Tool for more details):

- Name of the probe: A name of your choice that will be visible in the sensor tree in the web interface.
- Server Connection: Please choose "Connect to remote core server".
- Server (IP or DNS name). Please enter the server's IP address or DNS name (the one that you have specified in the core server administrator tool above). Note: If the core server resides in a NAT-ed network behind a firewall you must edit your firewall NAT settings and supply the external mapped IP address.
- Port: Please enter the same port number that you have set up in your Core Server above.

You can edit the access keys on the server through the web interface: Choose "Setup|System Setup" from the main menu of the web interface and you will see this screen:



You can enter one or more access keys in the web interface (one for each probe is recommended) and the exact

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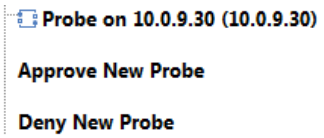
same string must be entered into the probe's setup, otherwise the core server will not accept a connection. By default PRTG accepts connections from any IP. Using the two settings you can make your configuration even more secure, especially by only allowing authorized IPs. Simply enter these IPs in the "Allow IPs" setting. If you ever need to hard block a probe from a specific IP, please enter the IP in the "Deny IPs" settings.

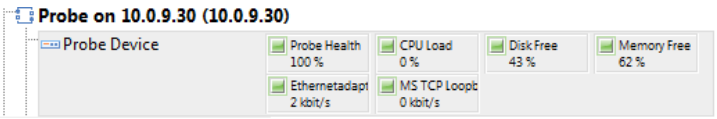
When you are done with the probe setup, the probe service is started automatically and the it tries to connect to the core server.

Step 3: Approving a New Probe

When a new probe has connected to the core server you must approve it in the web user interface:



Click on "Approve New Probe" to fully enable the probe. PRTG automatically creates a set of sensors for the probe to ensure that bottlenecks on the probe will always be noticed. It is recommended to keep these sensors.



Now you can create groups, devices and sensors for monitoring via the new probe.

Debugging Probe Connection Problems

If you have trouble with the setup of remote probes please look at the probe's log files which usually reside in the following folder on the probe system:

Windows XP and Server 2003:

```
C:\documents and settings\All Users\application data\Paessler\PRTG Network Monitor\V7\Logs (System)
```

Windows Vista and Server 2008:

```
C:\ProgramData\Paessler\PRTG Network Monitor\V7\Logs (System)
```

The probe process writes the two log files "PRTG Probe Log (1).log" and "PRTG Probe Log (2).log" alternatively. Please open the one with the most recent date.

For a correct connection the probe log should look similar to this:

```
23.05.2008 16:15:15 PRTG Probe Server V7.0.1.821
23.05.2008 16:15:15 Starting Probe on "WINXPVMWARE"
23.05.2008 16:15:15 Data Path: C:\documents and settings\All Users\a ....
23.05.2008 16:15:15 Local IP: 0.0.0.0
23.05.2008 16:15:15 Core Server IP and Port: 10.0.2.167:23560
23.05.2008 16:15:15 Probe ID: -1
23.05.2008 16:17:01 Connected to 10.0.2.167:23560
23.05.2008 16:17:06 Login OK: Welcome to PRTG
```

For example if the connection fails due to an incorrect Access Key password you will see:

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```
23.05.2008 16:31:02 Try to connect...
23.05.2008 16:31:02 Connected to 10.0.2.167:23560
23.05.2008 16:31:07 Login NOT OK: Access key not correct!
```

14.3 Copying Devices by Cloning or Using Device Templates

After configuring a device with one or more sensors there are two options to copy it:

- cloning a device: Is the best option to simply duplicate a device only a few times with all its sensors and settings.
- using a device templates: Is the preferred option if you have many similar devices and if you do not want to create all devices manually through the web interface. This is also the better option if the devices do not have the same number of ports.

Cloning a Device

Choose the context menu item "Clone" from the device's context menu. PRTG will ask you for the new parent group and well as a new name for the device. The new device will be initially be paused to give you the chance to edit sensor settings if necessary. When all sensors are configured correctly you can resume monitoring for the device with all its sensors.

Using Device Templates

In order to create a device template PRTG stores the definitions of the sensors of a device in a device template file. Later this template file can be used to recreate all sensors that can successfully be recreated for the a device. To create a device template choose the "Create Device Template" item from the device's context menu and PRTG will ask you for a filename and a template name. The template file will be stored in the 'devicetemplate' folder of your PRTG installation. To create new devices with the same set of sensors you now have two options:

- Create an auto-discovery group, select option "Automatic sensor creation using specific device template(s)" and choose this specific device template from the list of templates
- Create a new device, select option "Automatic sensor creation using specific device template(s)" and choose this specific device template from the list of templates

Limitations of Device Templates

Copying devices using device templates has the following limitations (cloning a device does not have these limitations):

- Only the following sensor types are supported: DNS, FTP, HTTP, HTTP Advanced, IMAP, PING, POP3, PORT, SMTP, SNMP Custom, SNMP Traffic, WMI Custom, WMI Disk Space, WMI Memory, WMI Service, WMI Processor, WMI Network, WMI Event Log, WMI Page File, WMI File, WMI Process, WMI Selection, EXE, Remote Desktop.
- Credentials settings of the device are not stored in the device template file. You should enter credentials on the group level before you create devices using a device template.
- Sensors that are created based on available objects (e.g. SNMP Traffic and WMI Network Card sensors which look at available ports of a device) will be recreated from scratch for all available ports on the new device.
- Schedules, triggers, dependencies and channel settings are not stored in device templates.

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14.4 Importing Data from PRTG Traffic Grapher 6 or IPCheck Server Monitor 5

You can import your sensor configuration and historic monitoring data from PRTG 7's predecessor products - PRTG Traffic Grapher V6 or IPCheck Server Monitor 5 - into your PRTG Network Monitor 7 installation using the Import tool.

Please see this Knowledge Base article on the Paessler website for details:

http://www.paessler.com/support/kb/prtg7/tricks/data_import_from_prtg6_or_ipcheck5/

14.5 Installing an SSL Certificate for the Web Server

PRTG Network Monitor comes with a default SSL certificate so you can securely use the web interface through HTTPS out-of-the-box. But because it is not an official certificate that matches the domain name or IP address of your PRTG installation a web browser will always show an alert (“the certificate is not correct”) when it connects to this server (although the transmission is already secure).

Please see the Paessler Knowledge Base for details:

http://www.paessler.com/support/kb/prtg7/tricks/install_ssl_certificate/

14.6 Using the PRTG API (Application Programming Interface)

PRTG Network Monitor includes an API that enables access to internal data for external programs. This means that you can create your own programs or scripts that have access to information from the monitoring database and are able to manipulate the object database of PRTG. The API is HTTP based and uses a set of URLs to access the data.

Please see the menu item "PRTG API" in the "Help" menu for details.

14.7 Interface Definition for Custom EXE Sensors

Every time the sensor is run, the selected EXE or DLL file is executed.

EXE Sensors

The string entered in the parameter field of the sensor's settings is placed in the command line. The EXE file must send the results to the Standard OUT. The data must be in the following format:

```
value:message
```

Value has to be a 32bit integer and will be used as the resulting value for this sensor (e.g. bytes, milliseconds, etc.), message can be any string and will be stored in the database.

The EXE's exit code has to be one of the following values:

- 0: ok
- 1: warning

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- 2: system error (e.g. a network/socket error)
- 3: protocol error (e.g. web server returns a 404)
- 4: content error (e.g. a web page does not contain a required word)

If the EXE does not return control to the PRTG process it is killed as soon as the timeout value set for this sensor is reached.

You can test the EXE file you want to use for the sensor very easily on the command line (cmd.exe). Simply start the EXE file and pipe the results into a file, e.g.:

```
sensorexe parameter > result.txt
```

The results are then written into the file result.txt and you can check the results with notepad or any other text editor.

DLL sensors

Every time the sensor is to be checked the selected DLL file is called. The DLL must export one function:

```
function perform(para,msg:pchar):integer; stdcall;
```

para and msg are zero terminated strings. The allocated buffer for msg is 255 bytes, the DLL must make sure that fewer bytes are returned. Msg must be in the following format:

```
value:message
```

Value has to be an 32 bit integer and will be used as the resulting value for this sensor (e.g. bytes, milliseconds, etc.), message can be any string and will be stored in the database.

The integer return value of the perform function has to be one of the following values:

- 0: ok
- 1: warning
- 2: system error (e.g. a network/socket error)
- 3: protocol error (e.g. web server returns a 404)
- 4: content error (e.g. a web page does not contain a required word)

Warning: If the function call in the DLL does not return control it could block the whole PRTG system. Make sure to handle your own timeouts and build in a reliable error management. For this reason EXE sensors are recommended.

Links

Sample projects for these Custom sensors can be found:

- in the "PRTG Network Monitor\custom sensors\EXE" subfolder of your PRTG installation.
- in the Knowledge Base on the Paessler website under http://www.paessler.com/support.
- on the prtg7addons website on the open source platform Google Code: http://code.google.com/p/prtg7addons/

14.8 Acknowledgements

Build using Indy Internet Direct (http://www.indyproject.org/). This product includes cryptographic software written by Eric Young (eay@cryptsoft.com). Uses the net-SNMP library, see "netsnmp-license.txt". Uses the

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DelphiZip library distributed under the GNU LESSER GENERAL PUBLIC LICENSE (http://www.delphizip.net/). Uses the Info.Zip library, license info in the provided "info-zip-license.txt". Uses FastMM (http://sourceforge.net/projects/fastmm/) and TPLockBox (http://sourceforge.net/projects/tplockbox) under the Mozilla Public License 1.1 (MPL 1.1, available from http://www.mozilla.org/MPL/MPL-1.1.html).

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